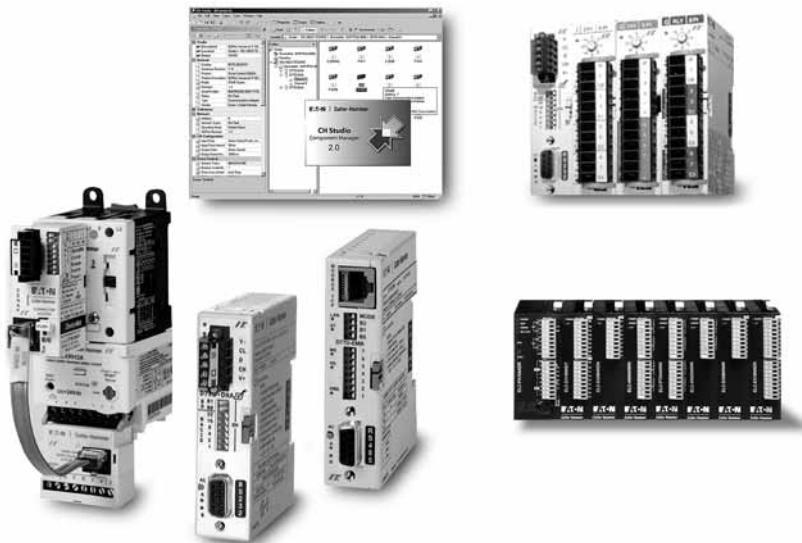


PLC, I/O & Communications Products

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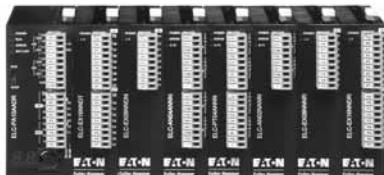
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Note: Supplement to Publication No. CA08102001E — Tabs 49 and 50.



ELC and IT. Products

ELC Product Family Overview



ELC Modules

The Eaton Logic Controller (ELC) is our latest offering into the PLC (Programmable Logic Controller) marketplace. With the latest technology, this reduced sized ELC with its abundant module selection will provide a "Just Right" concept of providing only what you want for the price you need.

- **Size** – Providing large PLC features/functions in a small 1" package. ELC is 1/3 the size of a D50, offering identical and even a larger feature set than the D50. ELC can provide 46 I/O in the space that a D50 could provide 14 I/O.
- **Flexibility** – ELC controllers can handle I/O counts from 10 I/O to 256 I/O using the same controller. ELC eliminates the process of counting I/O and deciding which controller to use, ELC is the only one needed. ELC modules come in many flavors of I/O from modules containing 4 in / 4 out to modules containing 8 in / 8 out. ELC is not a rack based system — it simply mounts to a DIN rail. Add modules by simply snapping them into the mating connectors and closing the attached locks.
- **Large PLC Features** – ELC has the feature set of larger PLCs, from its multiple communications ports, remote I/O ability, data storage, high speed counter, high speed pulse outputs, interrupts, timer resolution to 1 ms, PID, plus much more.

- **Software** – ELCSoft, the software, configures the entire line of ELC controllers. Priced less than \$200, it programs in standard ladder logic and sequential function chart programming. It will aid in knowing what registers are in use and what modules are attached to the ELC. It monitors the runtime application, allows forcing (except basic), and entering values. Software wizards aid programming of remote I/O, standard communications and PIDs.
- **Power of One** – ELC communicates easily to MVX drives, eliminating the need to operate drives by analog voltage/current or digital I/O. ELC can access all of the parameters in the MVX by serial communications, saving OEM money. ELC communicates to **IT**. I/O through the Modbus TCP gateway. This allows ELC to control the **IT**. I/O if local control is desired. This will also allow **IT**. I/O to be used in communicating MCC applications where the ELC can be either a DeviceNet™, Profibus, or ModbusTCP communicating MCC. ELC communicates to PowerNet Modbus products, allowing ELC connectivity to Switchgear and PowerNet applications.
- **Price** – Following the "Just Right" concept, ELC is priced correctly to please customers.
- High speed pulse capture and high speed pulse output on all controllers
- Interrupts
- Large module selection AC/DC in, relay/transistor out
- Large analog selection of analog in, out, combined, thermocouple, RTD Platinum
- Over 200 instructions to choose from: Floating point math, communications, hex, decimal, octal, BCD, ASCII conversion, 1, 4, 8, 16, 32, bit manipulations, logical, block move, block compare, retentive data storage, time base from clock/calendar
- 2 Modbus (ASCII or RTU) serial ports: 1 slave only, 1 master/slave
- Network communications on Modbus TCP, DeviceNet and Profibus
- ELC controller can be wired for remote I/O communications (except the PB model).

ELC Modules

ELC Expansion Modules

ELC expansion modules provide the correct amount of I/O for application solutions. Choose 4, 8, or 16 I/O. Any number of expansion modules can be added to the ELC processor to create 256 I/O (128 Inputs and 128 Outputs maximum).

ELC Specialty Modules

In addition to expansion I/O, specialty modules like Analog In, Analog Out, Platinum Temperature, Thermocouple, DeviceNet, PROFIBUS DP and Switch Module, etc. can be added. Use the ELC-485APTR to easily connect to the RS-485 port of MVX drive, ELC controllers and other devices.

ELC Controllers/Modules

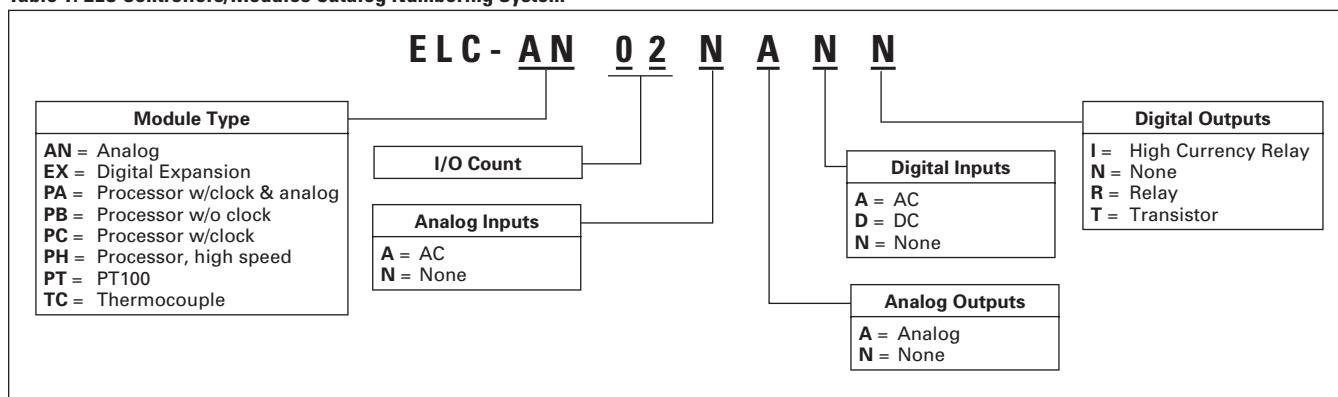
Product Description

ELC Controllers

The ELC family offers four styles of controllers. These controllers offer combinations of the following features:

Catalog Number Selection

Table 1. ELC Controllers/Modules Catalog Numbering System



Features

ELC Controllers

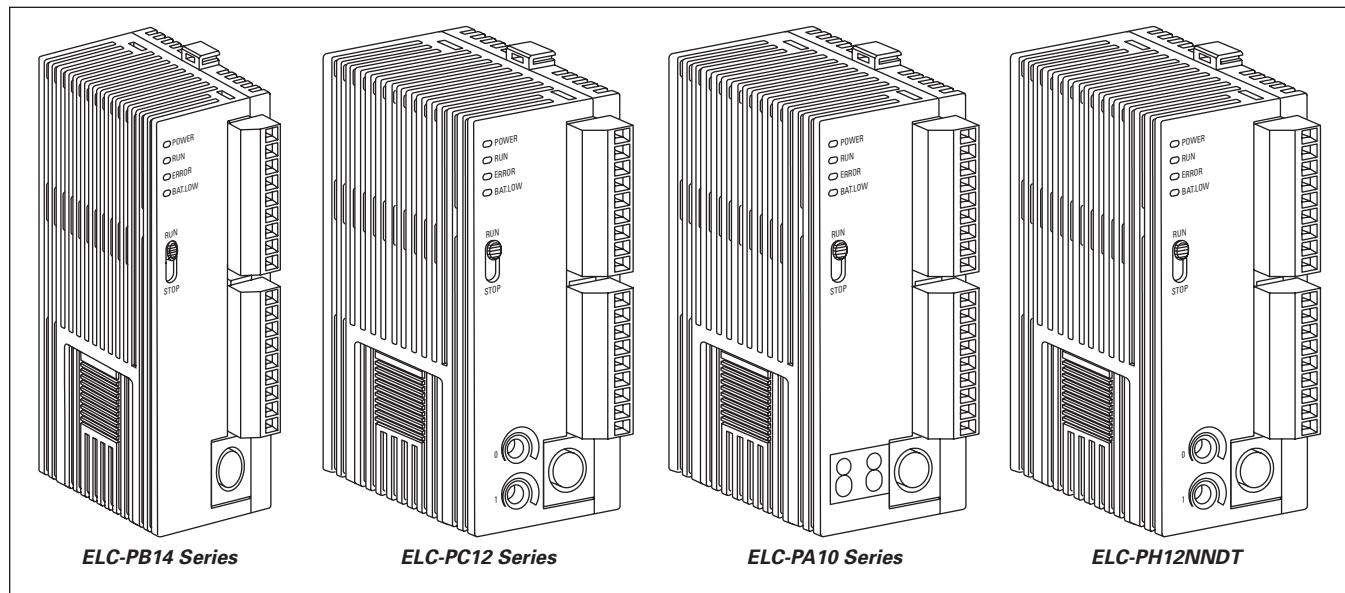
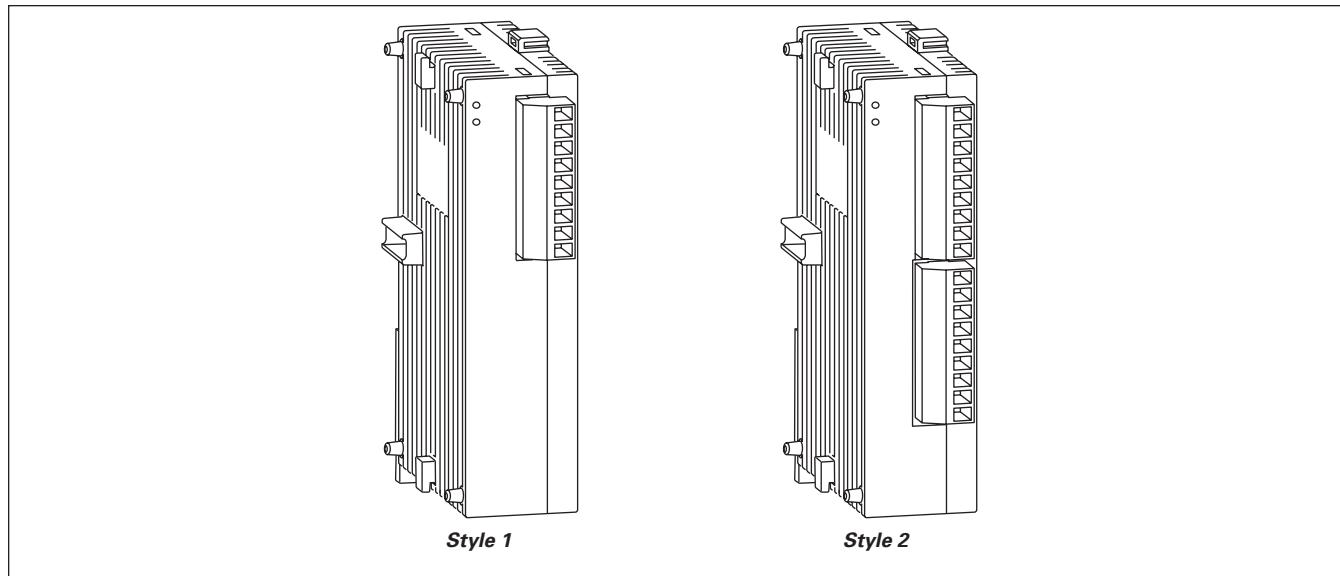


Figure 1. ELC Controllers

Table 2. ELC Controller Features

Items	ELC-PB14 Series	ELC-PC12 Series	ELC-PA10 Series	ELC-PH12NNDT			
Maximum I/O	256 (128 In / 128 Out) Any number of modules						
I/O Type	14 (8 In / 6 Out) – Digital	12 (8 In / 4 Out – Digital)	10 (4 In / 2 Out Digital, 2 In / 2 Out Analog)	12 (8 In / 4 Out – Digital)			
Execution Speed	Basic commands - 2µ seconds minimum						
Program Language	Boolean + Ladder Logic + SFC						
Program Capacity	3792 Steps	7920 Steps					
Data Memory Capacity (bits)	1280 Bits	4096 Bits					
Data Memory Capacity (words)	744 Words	5000 Words					
Index Registers	2 Words	8 Words					
File Memory Capacity	—	1600 Words					
Commands	32 Basic / 107 Advanced	32 Basic / 168 Advanced					
Floating Point	Yes	Yes					
SFC Commands	128 Steps	1024 Steps					
Timers	128 (1 – 100 ms)	256 (1 – 100 ms)					
Counters	128 (16 Bit / 32 Bit / Up/Down)	250 (16 Bit / 32 Bit / Up/Down)					
High Speed Counters	1 (14 modes) 10K Max	1 (14 modes) 20 kHz for PA/PC 100 kHz for PH					
Pulse Output	2 channels 10 kHz Max	2 channels, 40 kHz Max for PC/PA, 100 kHz for PH					
Master Control Loop	8 Loops						
Subroutines	64 Subroutines	256 Subroutines					
Interrupts	6	15 (External / Time base / HS CNTR / Comm.)					
Real-time Clock/Calendar	—	Built-in					
Specialty Expansions Modules	8 (Analog In / Analog Out / TC / PT) Modules do not count in total I/O						
Serial Ports	2 (1 – RS-232, 1 – RS-485)						
Special Features	—	2 Potentiometers	2 7-Segment Displays	2 Potentiometers			

ELC Expansion Modules**Figure 2. ELC Expansion Modules****Table 3. ELC Expansion Module Features**

Model	Style	Inputs		Outputs	
		Points	Type	Points	Type
ELC-EX08NNAN — AC IN	1	8	120V AC	0	—
ELC-EX08NNDN — DC IN	1	8	DC Sink or Source	0	—
ELC-EX08NNNR — Relay OUT	1	0	—	8	Relay
ELC-EX08NNNT — Transistor OUT	1	0	—	8	Transistor
ELC-EX06NNNI — High Current Relay OUT	2	0	—	6	Relay (6 Amps)
ELC-EX08NNDR — IN/OUT Combo	2	4	DC Sink or Source	4	Relay
ELC-EX16NNDR — IN/OUT Combo	2	8	DC Sink or Source	8	
ELC-EX08NNDT — IN/OUT Combo	2	4	DC Sink or Source	4	Transistor
ELC-EX16NNDT — IN/OUT Combo	2	8	DC Sink or Source	8	

ELC Specialty Modules

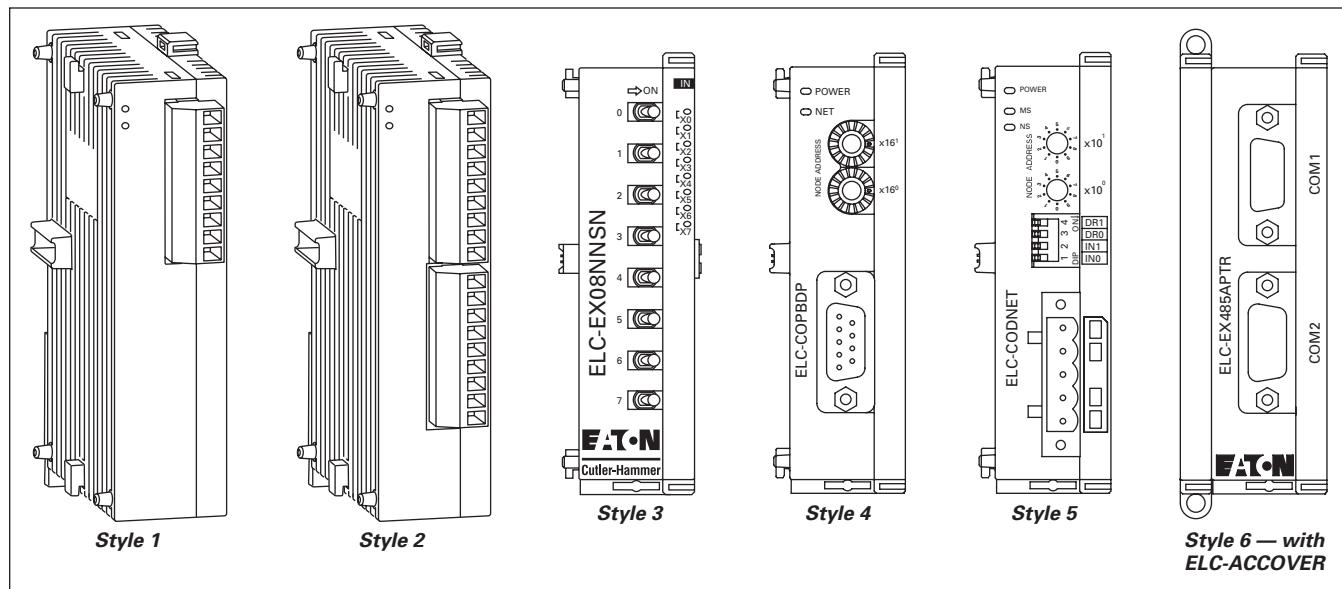


Figure 3. ELC Specialty Expansion Modules

Table 4. ELC Expansion Module Features

Model	Power	Style	Inputs		Outputs	
			Points	Type	Points	Type
ELC-AN02NANN — Analog OUT	24V DC	1	0	-20 mA~20 mA	2 (12 bits)	0~20 mA, 4~20 mA
ELC-AN04NANN — Analog OUT		2	0	-10V ~ +10V	4 (12 bits)	0V ~ +10V, 2V ~ +10V
ELC-AN06AANN — Analog Combo		2	4	±10V, ±20 mA	2 (12 bits)	0~20 mA, 0 ~ +10V
ELC-AN04ANNN — Analog IN		2	4 (V = 14 bits, I = 11 bits)	±10V, ±20 mA	0	
ELC-PT04ANNN — PT100		2	4 (V = 14 bits, I = 13 bits)	PT100	0	
ELC-TC04ANNN — Thermocouple		2	4	Thermocouple	0	
ELC-EX08NNSN — Switch Input	24V DC	3	8	Switch	0	
ELC-COPBDP — PROFIBUS DP	24V DC	4	32	Digital	32	Digital
ELC-CODNET — DeviceNet	24V DC	5	32	Digital	32	Digital
ELC-485APTR — RS-485 Easy Connect	N/A	6	0	—	0	—

Product Selection

Table 5. ELC Controllers (PB, PC, PA, PH)

Description	Inputs			Outputs			Max. Current Consumption (at 24V DC)	Catalog Number	Price U.S. \$
	AC	DC	Analog	Relay	Transistor	Analog			
14 I/O PB Series		8		6			150 mA	ELC-PB14NNDR	149.00
14 I/O PB Series		8			6		150 mA	ELC-PB14NNDT	149.00
12 I/O PC Series	8			4			250 mA	ELC-PC12NNAR	198.00
12 I/O PC Series		8		4			250 mA	ELC-PC12NNDR	198.00
12 I/O PC Series		8			4		250 mA	ELC-PC12NNDT	198.00
10 I/O PA Series		4	2	2		2	210 mA	ELC-PA10AADR	341.00
10 I/O PA Series		4	2		2	2	210 mA	ELC-PA10AADT	341.00
12 I/O PH Series		8			4		170 mA	ELC-PH12NNDT	198.00

Table 6. Digital I/O Expansion Modules

Description	Inputs		Outputs		Max. Current Consumption (at 24V DC)	Catalog Number	Price U.S. \$
	AC	DC	Relay	Transistor			
6 I/O Expansion (6 Amp Outputs)			6		70 mA	ELC-EX06NNNI	105.00
8 I/O Expansion — AC IN		8			50 mA	ELC-EX08NNAN	71.50
8 I/O Expansion — DC IN		8			50 mA	ELC-EX08NNDN	60.50
8 I/O Expansion — Relay OUT			8		70 mA	ELC-EX08NNNR	93.50
8 I/O Expansion — Transistor OUT				8	70 mA	ELC-EX08NNNT	93.50
8 I/O Expansion — IN/OUT Combo		4			70 mA	ELC-EX08NNDR	93.50
8 I/O Expansion — IN/OUT Combo		4			70 mA	ELC-EX08NNDT	93.50
16 I/O Expansion — IN/OUT Combo		8	8		90 mA	ELC-EX16NNDR	105.00
16 I/O Expansion — IN/OUT Combo		8		8	90 mA	ELC-EX16NNDT	105.00
8 I/O Expansion — Switch Input		8			20 mA	ELC-EX08NNSN	71.50

Table 7. Analog I/O Modules

Description	Analog In	Analog Out	Max. Current Consumption (at 24V DC)	Catalog Number	Price U.S. \$
4 I/O Analog In	4		90 mA	ELC-AN04ANNN	193.00
2 I/O Analog Out		2	125 mA	ELC-AN02NANN	182.00
4 I/O Analog Out		4	170 mA	ELC-AN04NANN	253.00
6 I/O Analog In/Out	4	2	90 mA	ELC-AN06AANN	264.00
4 I/O Thermocouple J, K, R, S, T	4		90 mA	ELC-TC04ANNN	275.00
4 I/O Platinum RTD, PT100	4		90 mA	ELC-PT04ANNN	242.00

Table 8. Accessory Modules

Description	Catalog Number	Price U.S. \$
Profibus DP Module	ELC-COPBDP	358.00
DeviceNet Module	ELC-CODNET	253.00
RS-485 Easy Connect Adapter, DB9, RJ-12, 2-Pin Connections to RS-485	ELC-485APTR	60.50
Motion Control, 1 Axis Module (Up to 8 Modules per Controller)	ELC-MCO1	336.00

Standards and Certifications

Table 9. Approvals/Certifications

Description	Specification
Electrical/EMC	
ESD Immunity	8 kV air discharge
EFT Immunity	Power Line: 2 kV; Digital I/O: 1 kV; Analog & Communication I/O: 250V
Damped-Oscillatory Wave	Power Line: 1 kV; Digital I/O: 1 kV
RS Immunity	26 MHz – 1 GHz, 10 V/m
Other Approvals	
Agency Certifications	UL 508, cUL, CE; Class 1 Div 2 Group A, B, C, D

Technical Data and Specifications

Table 10. Environmental Ratings

Description	Specification
Transportation & Storage	
Temperature	-13° – 158°F (-25° – 70°C)
Humidity	5 – 95%
Operating	
Temperature	32° – 131°F (0° – 55°C)
Humidity	50 – 95%
Power Supply Voltage	ELC: 24V DC (-15% – 20%) (With DC input reverse polarity protection), Expansion Unit: supplied by the ELC
Power Consumption	3 – 6W
Insulation Resistance	> 5 MΩ at 500V DC (Between all inputs/outputs and earth)
Grounding	The diameter of grounding wire cannot be smaller than the wire diameter of terminals L and N (All ELC units should be grounded directly to the ground pole).
Vibration / Shock Resistance	Standard: IEC1131-2, IEC 68-2-6 (TEST Fc) / IEC1131-2 & IEC 68-2-27 (TEST Ea)
Weight (approx.)	0.348 Lbs (0.158 kg)

Table 11. DC Input Point Electrical Specifications

Description	Specification
Input Type	DC (SINK or SOURCE)
Input Current	24V DC 5 mA
Active Level	OFF → ON, above 16V DC ON → OFF, below 14.4V DC
Response Time	About 10 mS (An adjustment range of 0 – 10,000 mS could be selected through D1020 and D1021)

Table 12. Output Point Electrical Specifications

Output Type	Relay – R	Transistor – T	
Current Specification	1.5A/1 point (5A/COM)	0.3A/1 point @ 40°C; When the output of Y0 and Y1 is high-speed pulse, Y0 and Y1 = 30 mA	
Voltage Specification	Below 250V AC, 30V DC	30V DC	
Maximum Loading	75 VA (Inductive)	9W/1 point	When the output of Y0 and Y1 is high-speed pulse, Y0 and Y1 = 0.9W (Y0 = 32 kHz, Y1 = 10kHz), Y0 can be 50 kHz using D registers.
	90W (Resistive)		
Response Time	Adjustable 0 – 15 ms, default is 10 ms	OFF → ON 20 µs ON → OFF 30 µs	Y0 and Y1 are specified points for high-speed pulse

ELC Controllers/Modules

ELC Accessories**ELC-GPXFERMOD**

Transfer programs to or from ELC-GPx units. These devices can be write protected to maintain program integrity.

ELC-HHP

ELC-HHP is an easy-to-use, hand-held programming tool for ELC controllers when a PC is not available. With ELC-HHP, applications can be programmed directly with the attached keypad. Or uploaded from an ELC, saved, and transferred to a different ELC. Or

downloaded from a PC and transferred to other ELCs. No need for outlets when using the ELC-HHP since it draws its power from either the ELC or the PC through the attached cable. Monitor applications when a PC is not available.

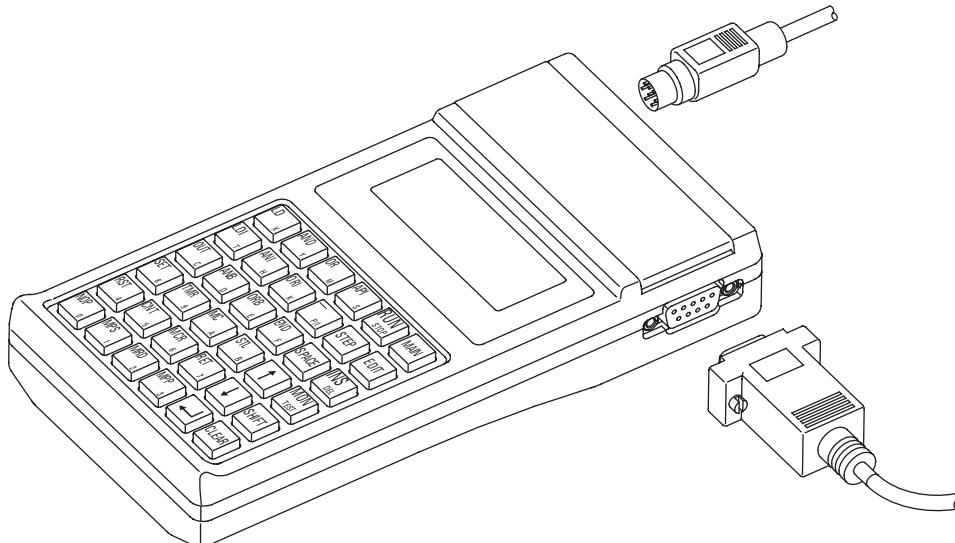


Figure 4. ELC-HHP with Cables for ELC and PC Connections

ELC Power Supplies

All ELC modules operate from 24V DC. These power supplies provide a convenient way to provide robust DC voltage.

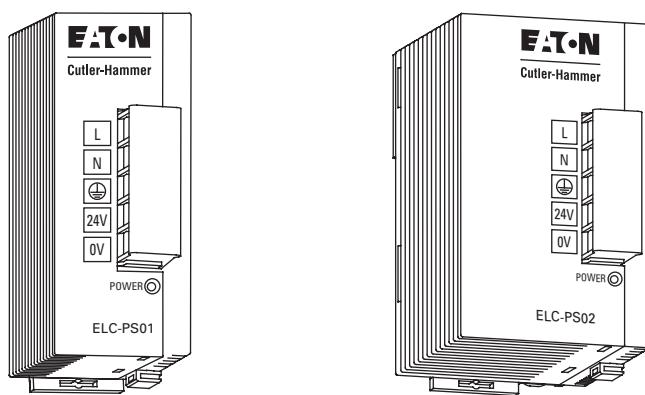


Figure 5. ELC Power Supplies

Table 13. ELC Power Supply Specifications

Item	ELC-PS01	ELC-PS02
Dimensions WxHxD in Inches (mm)	1.44 x 3.54 x 2.36 (36.5 x 90 x 60)	2.17 x 3.54 x 2.36 (55 x 90 x 60)
Input Power		100 – 240V AC 50/60 Hz
Output Volts		24V DC
Output Current (A)	1A	2A
Watts	24	48

ELC-CBPCELC3

Use this cable to download, upload, monitor ELC controllers. Or use this same cable to connect any ELC-GPxx to an ELC controller. This cable is 3 meters long.

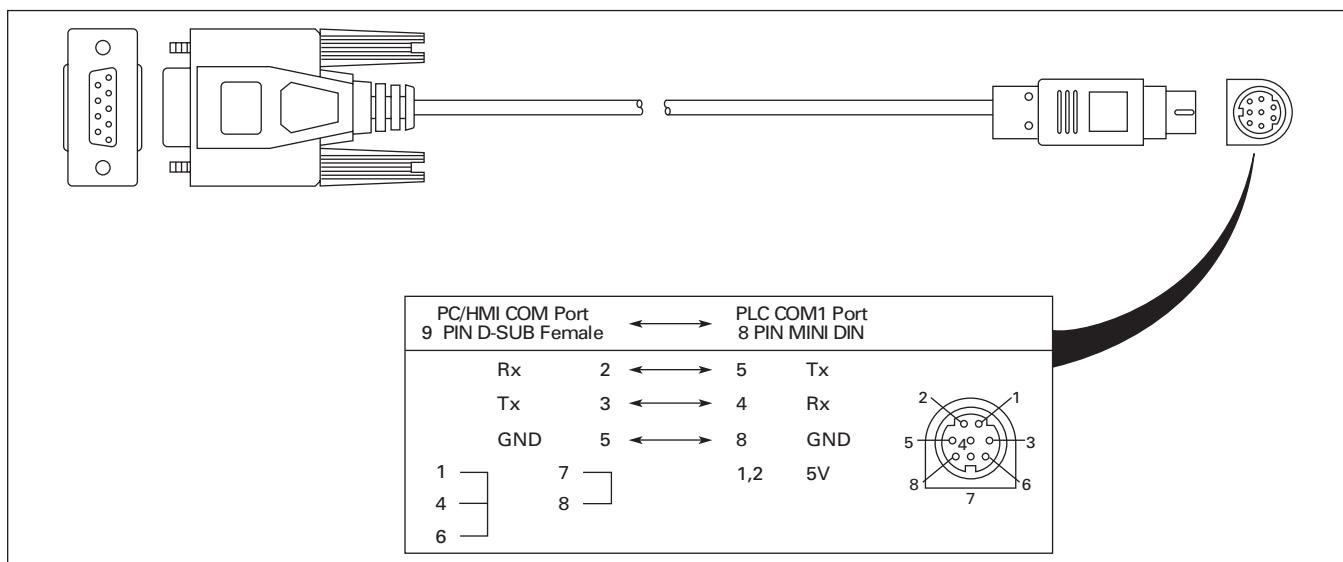


Figure 6. ELC-CBPCELC3 Cable

ELC-CBPCGP3

Use this cable to download or upload applications between a PC and the ELC-GPxx graphics panels. This cable can also be used to transfer a program from an ELC-GPxx to another ELC-GPxx. This cable is 3 meters long.

- The Pin definition of 9 PIN D-SUB RS-232:

**ELC-GP04 COM Port
RS-232 9 PIN D-SUB Male**

3	Tx
2	Rx
5	GND

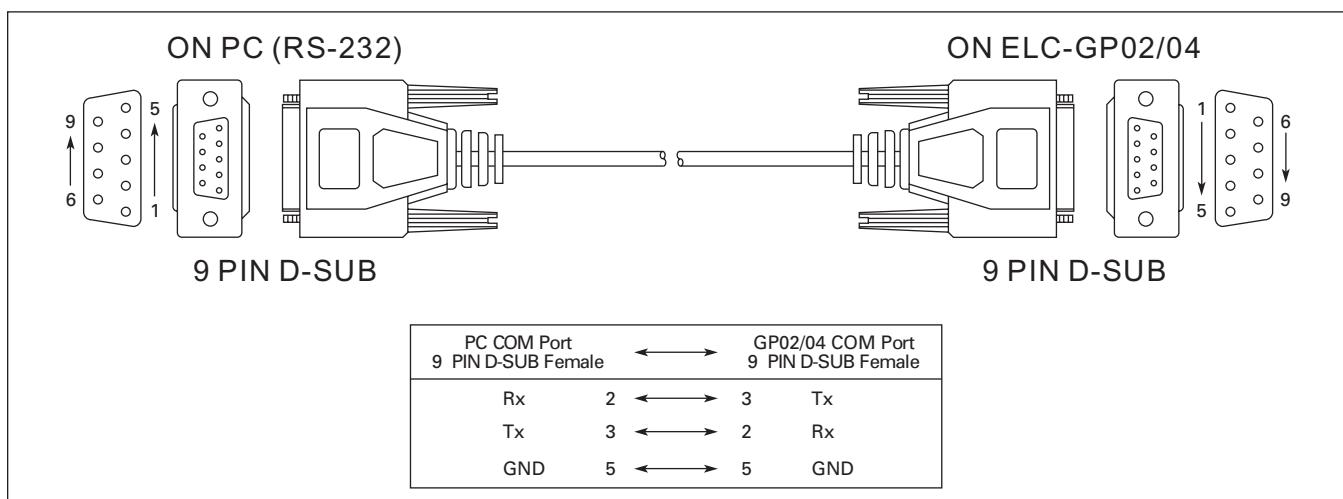


Figure 7. PC or GP02/04

Table 14. ELC Accessories

Description	Catalog Number	Price U.S. \$
24 Watt, 1 Amp Power Supply	ELC-PS01	49.50
48 Watt, 2 Amp Power Supply	ELC-PS02	71.50
Hand-Held Programmer (Includes ELC-CBHHELC15)	ELC-HHP	286.00
Cable to Connect a PC or a GP unit to ELC, 3 meters (DB9 pin female to 8 pin DIN)	ELC-CBPCELC3	34.25
Cable to Connect a PC to a GP unit. 3 meters (DB9 pin female to DB9 pin female)	ELC-CBPCGP3	34.25
Program transfer module for GP units	ELC-GPXFERMOD	71.50
Program transfer module for ELC controllers	ELC-ACPGMXFR	105.00
Plate mount for specialty modules, qty. 10	ELC-ACCOVER	82.50
ELC Starter Kit (Includes ELC-PA10AADT, ELC-PS01, ELC-GP04, ELC-CBPCELC3, ELC-CBPCGP3, ELCSoft, ELCSoft GP)	ELCSTARTKIT1	605.00

Dimensions

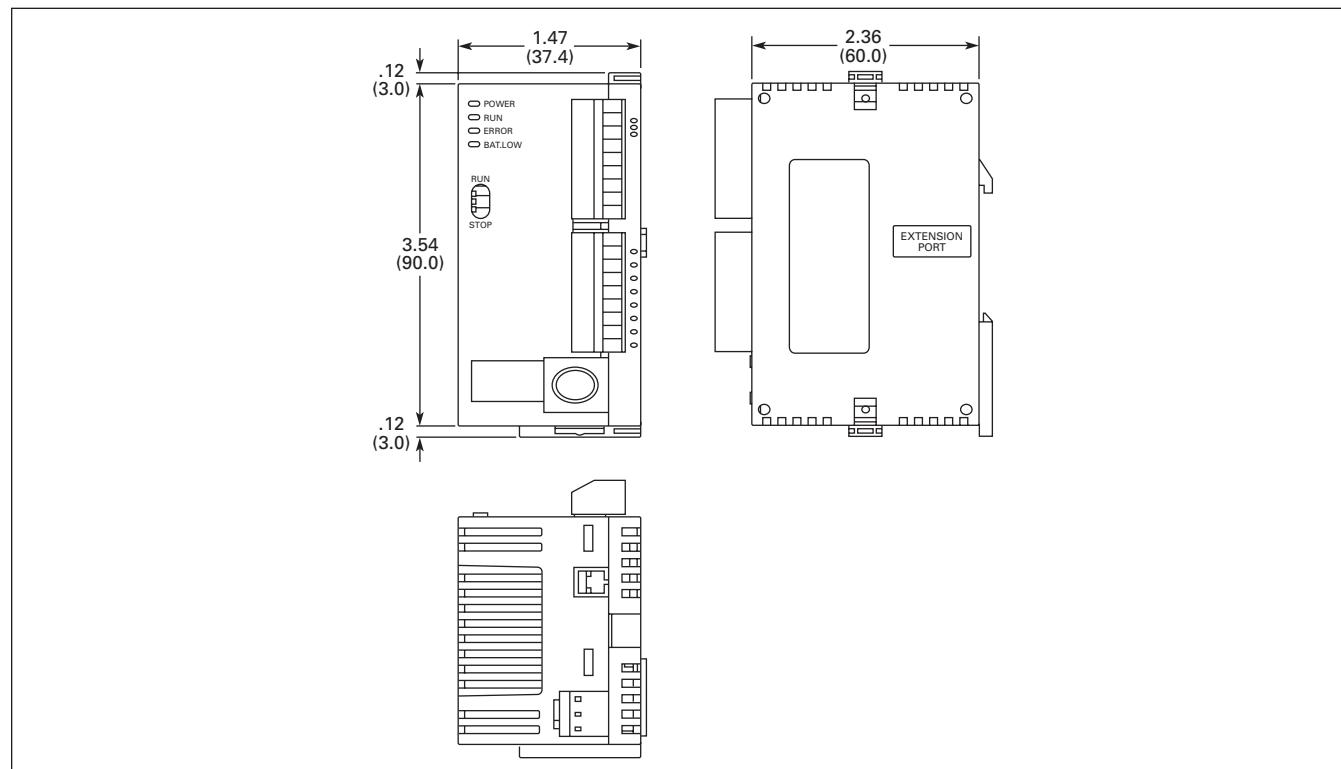


Figure 8. ELC-PA10, ELC-PC12 and ELC-PH12 Controllers — Approximate Dimensions in Inches (mm)

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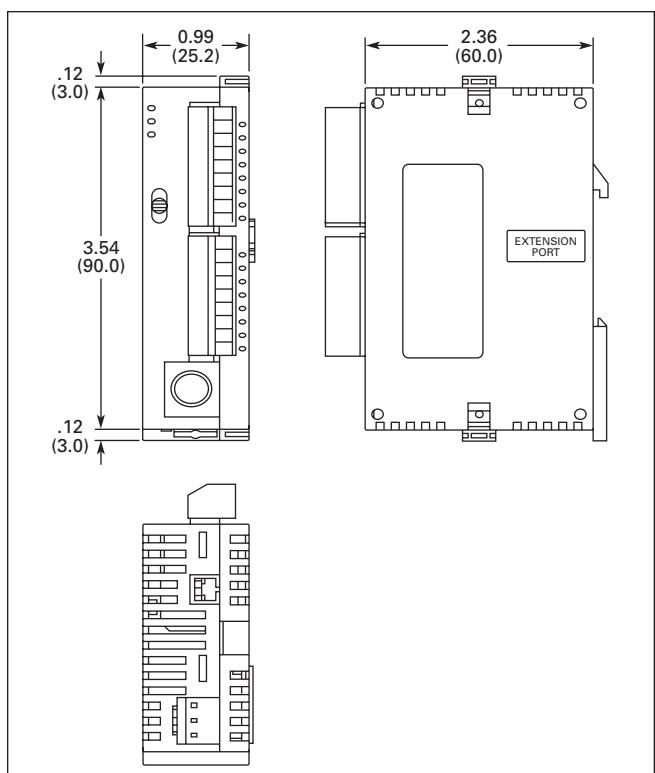
ELC Controllers/Modules

Figure 9. ELC-PB14 Controllers — Approximate Dimensions in Inches (mm)

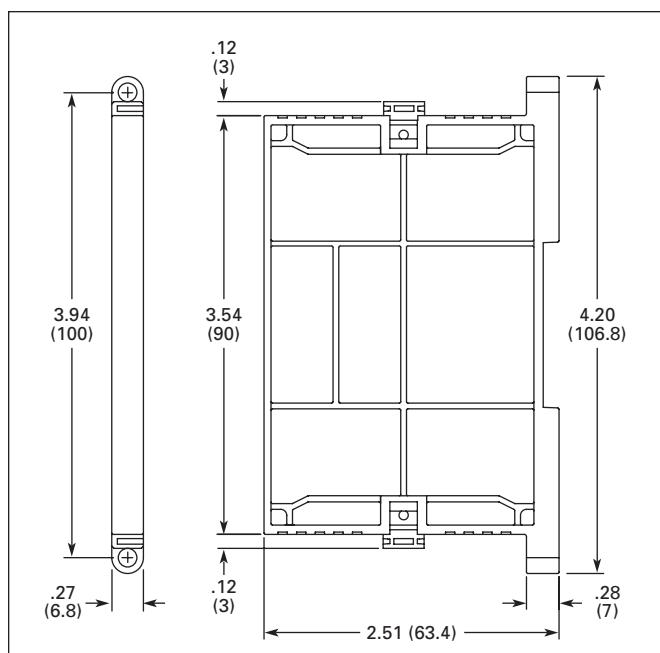


Figure 11. Plate Mount for Specialty Modules

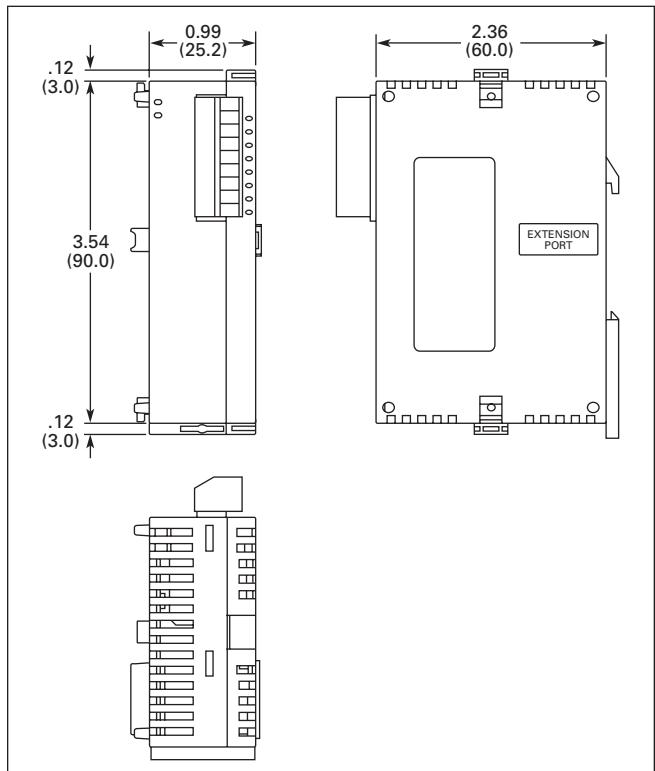


Figure 10. ELC Specialty Module — Approximate Dimensions in Inches (mm)

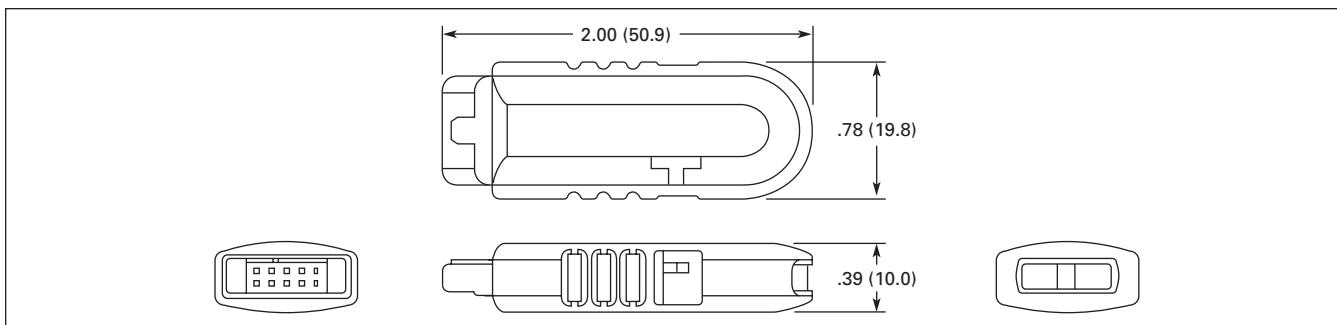


Figure 12. ELC-GPXFERMOD — Approximate Dimensions in Inches (mm)

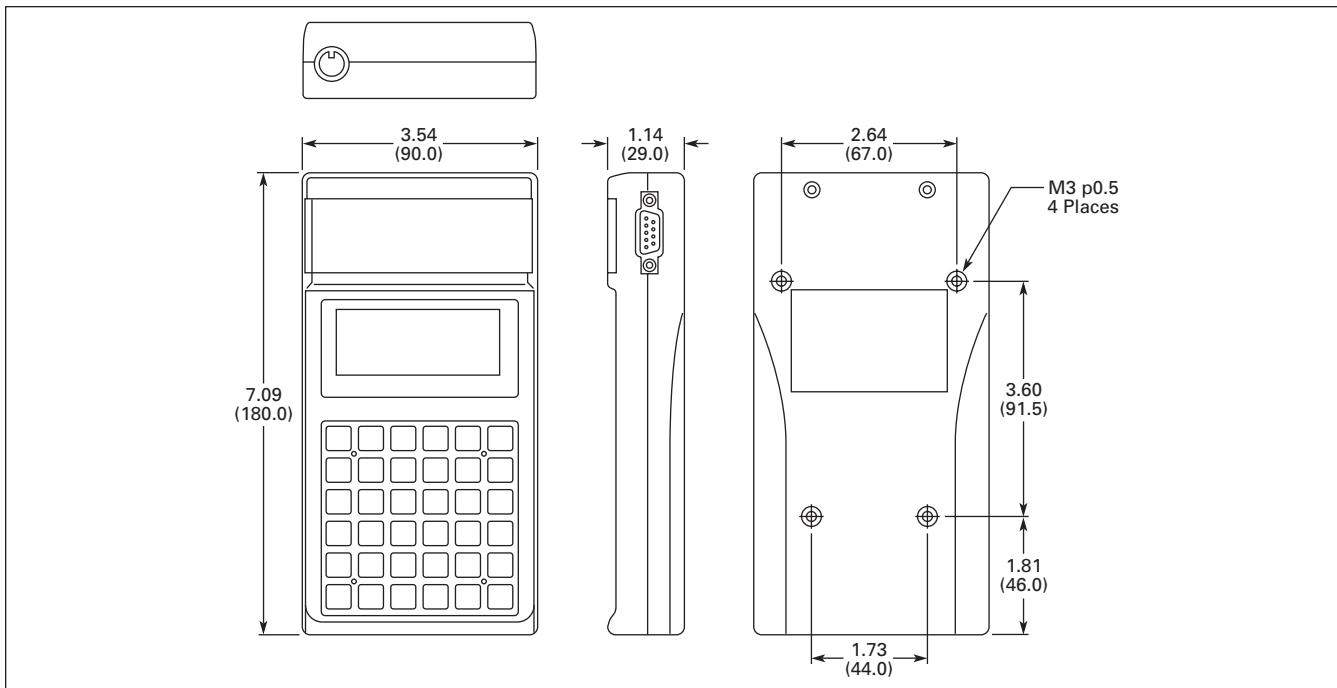


Figure 13. ELC-HHP — Approximate Dimensions in Inches (mm)

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ELC Controllers/Modules

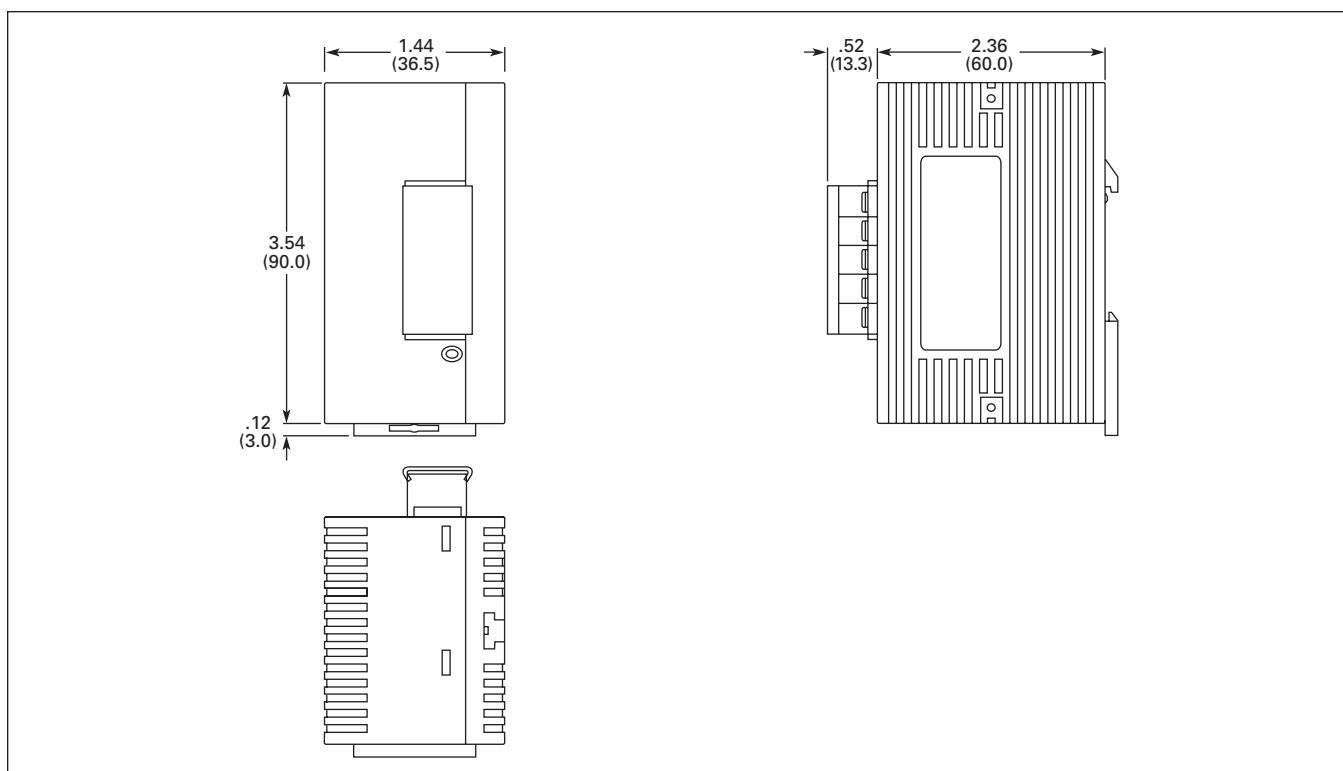


Figure 14. ELC-PS01 Power Supply — Approximate Dimensions in Inches (mm)

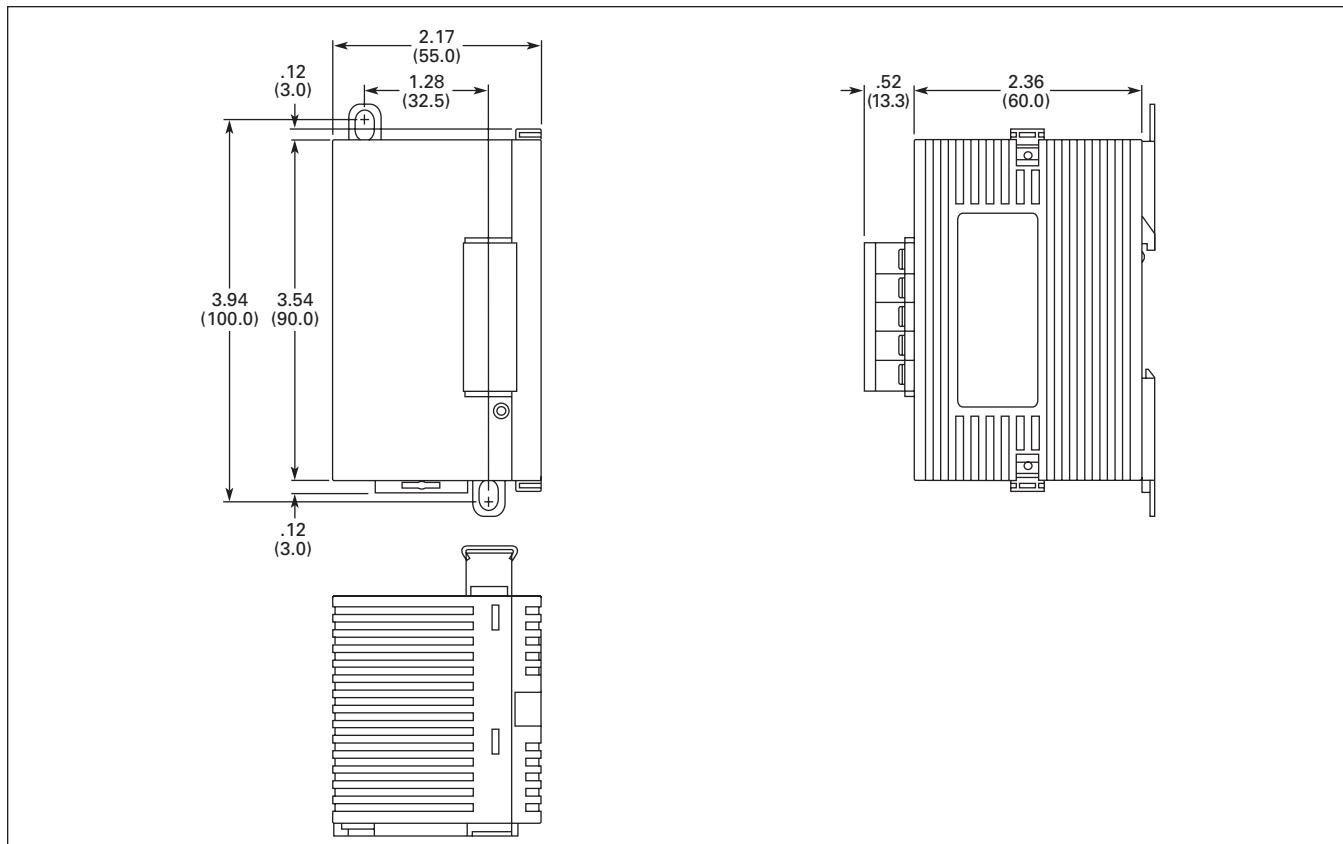


Figure 15. ELC-PS02 Power Supply — Approximate Dimensions in Inches (mm)

ELC Graphics Panels

ELC Graphics Panels**Product Description**

ELC Graphics Panels are simple to program and easily connect to ELC products. ELC graphics panels make modifying an application quick and easy. ELC graphics panels also connect to Cutler-Hammer® MVX drives, IQ MODBUS meters and many other devices. With over 30 objects that can be placed anywhere on the display, these tough panels also communicate to other major controllers. These graphics panels have two serial ports which can be used simultaneously to communicate. Transfer applications to or from these graphics panels using the handy transfer module. Ten programmable functions keys provide easy to change pages, input numeric values, enter alpha-numeric passwords, set, reset and more. Create alarms, password protect, import bitmaps, and use many different fonts.

Protocols Supported

- Eaton D50/D32LT, D320
- Eaton ELC
- Eaton MVX ASCII
- Eaton MVX RTU
- MODBUS ASCII
- MODBUS RTU
- AB DF1
- Mitsubishi FX Series
- Mitsubishi FX2N Series
- Koyo K-Sequence
- LG 200S
- OMRON C-Series
- Siemens 57-200 Series
- ASCII Slave Mode
- And more...

**Features****Table 15. ELC Graphics Panel Features**

Item	ELC-GP02	ELC-GP04
Display Screen		
Screen	STN-LCD	
Color	Monochromatic	
Back-light	The back-light automatic turn off time is 1 – 99 minutes (0 = do not to turn off) (back-light life is 50 thousand hours at 25°C)	
Resolution	160X32 pixels	128X64 pixels
Display Range	72 mm (W) X 22 mm (H)	67mm (W) X 32mm (H); 3.00" (diagonal preferred)
Contrast Adjustment	15-step contrast adjustment	10-step contrast adjustment
Language Font	ASCII: characters (including European Fonts) Taiwan: (BIG 5 code) traditional Chinese character font China: (GB2324-80 code) simplified Chinese character font	
Font Size (ASCII)	5 X 8, 8 X 8, 8 X 12, 8 X 16	
ALARM Indication LED	1. Power on indication (Flash three times) 2. Flash for communication error or other alarm 3. Special Indication by user programming	
RS-232 LED (Yellow)	Flashes when communicating	
RS-485 LED (Green)	Flashes when communicating	
Program Memory		
Program Memory	256KB flash memory	
External Interface		
Serial Communication Port RS-232 (COM1) 9 PIN D-SUB male	Data length: 7 or 8 bits Stop bits: 1 or 2 bits Parity: None/Odd/Even Baud Rate: 4800 bps – 115200 bps	
Extension Communication port RS-485 (COM2) 5-Pin Removal Terminal (RS-485 or RS-422)	Data length: 7 or 8 bits Stop bits: 1 or 2 bits Parity: None/Odd/Even Baud Rate: 4800 bps – 115200 bps	
Extension Slot	The slot for program copy card	
Power	24V DC input	

Product Selection**Table 16. Graphics Panels**

Description	Catalog Number	Price U.S. \$
160 x 32 pixels, 10 Function Keys, Monochrome	ELC-GP02	209.
128 x 64 pixels, 10 Function Keys, Monochrome	ELC-GP04	314.

Discount Symbol 2CD-5

Standards and Certifications

Table 17. Approvals/Certifications

Description	Specifications
Electrical/EMC	
Electrostatic Discharge Immunity	EN61000-4-2/1995
Radiated Immunity	EN61000-4-3/1995
Electrical Fast Transient	EN61000-4-4/1995
Radiated Emission	CISPR22, Class A
Other Approvals	
Waterproof Class of Front Panel	UL Type 4X Outdoor Rated
Agency Certifications	UL 508, cUL (CSA C22.2 No. 14); CE (Low Voltage Directive); Class 1 Div 2 Groups A, B, C, D

Technical Data and Specifications

Table 18. Environmental Ratings/Specifications

Description	Specification
Transportation & Storage	
Temperature	-4° – 140°F (-20° – 60°C)
Operating	
Temperature	32° – 122°F (0° – 50°C)
Humidity	20 – 90% RH (non-condensing)
Communication Interface	COM1: RS-232; COM2: RS-485/RS-422
Vibration	0.5 mm displacement, 10 – 55 Hz, X, Y, Z three directions and two hours for each direction
Impact	10G, 11 mS, from X, Y, Z three directions and three times for each direction
Weight	0.53 Lbs. (0.24 kg)
Cooling Method	Natural Air Cooling

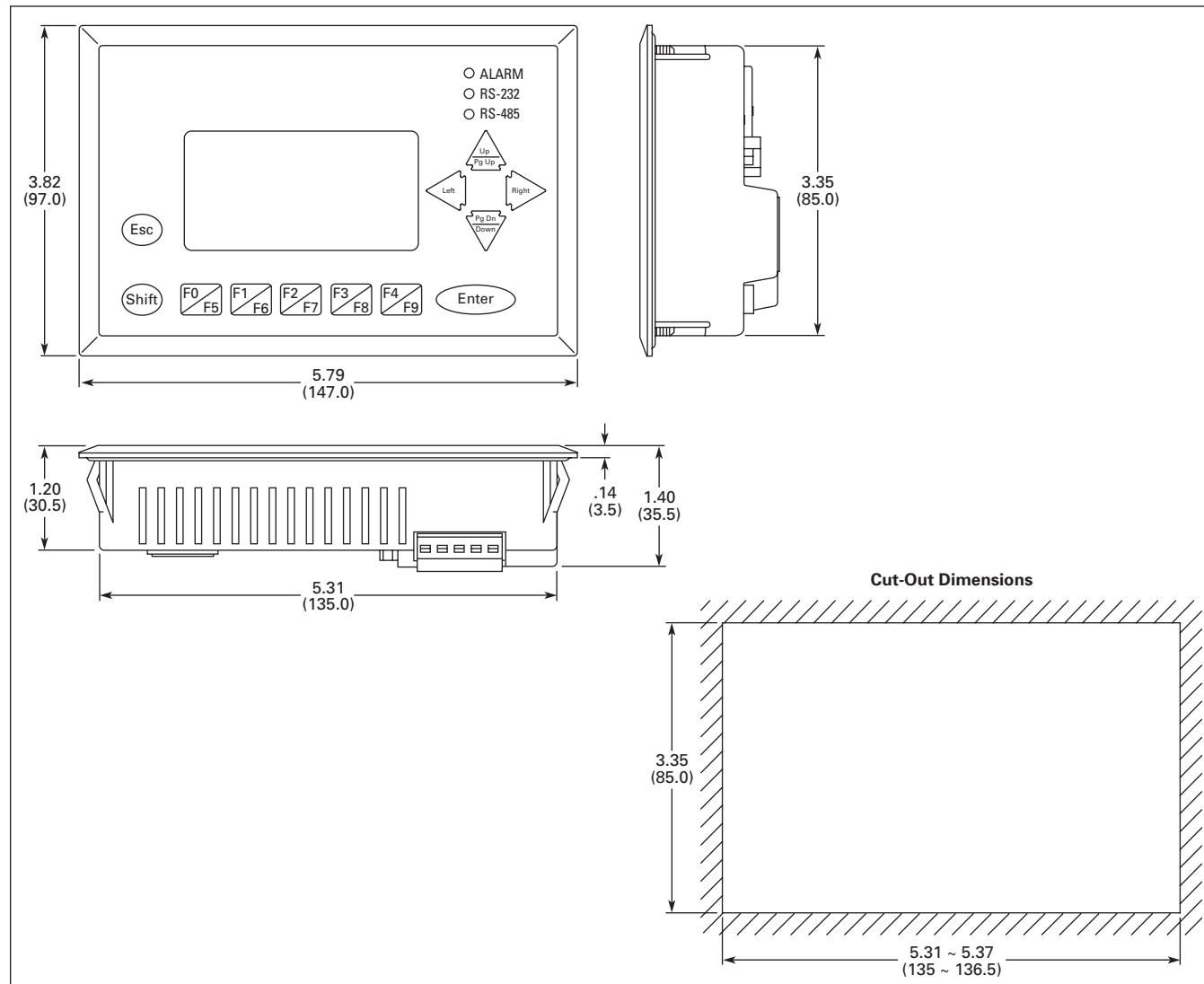
Dimensions

Figure 16. ECL-GP04 — Approximate Dimensions in Inches (mm)

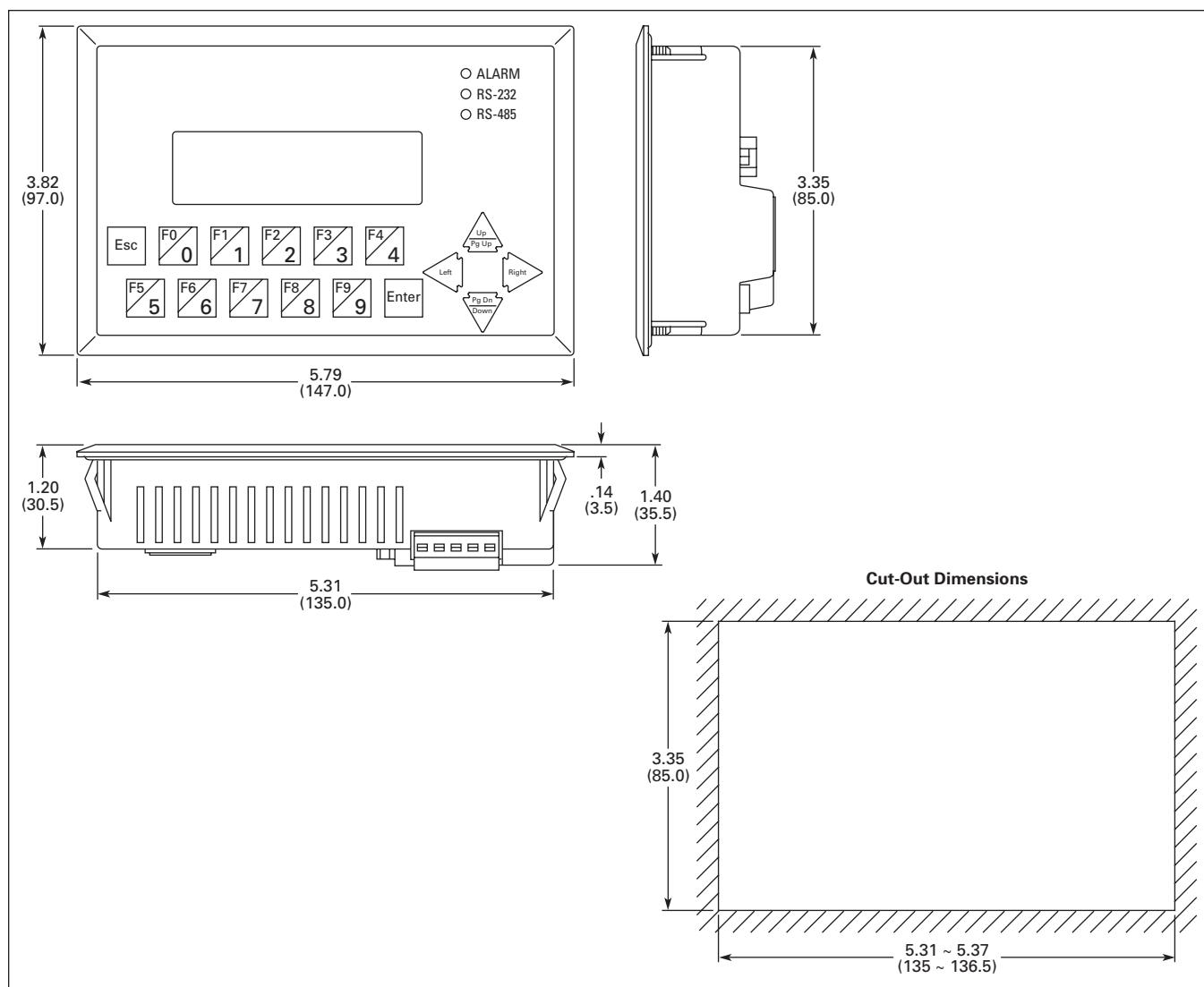


Figure 17. ECL-GP02 — Approximate Dimensions in Inches (mm)

ELCSoft Programming Software

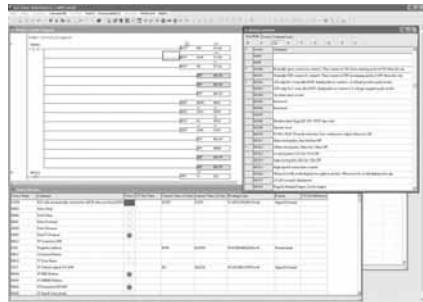
ELCSoft Programming Software configures all ELC controllers. With ELCSoft, applications can be created, edited, monitored, forced, etc. Move programs from one controller to a different one with ease.

Requirements:

- **Operating Systems** – Windows 98, Windows ME, Windows 2000, Windows XP
- **Hard Drive** – At least 100M bytes
- **RAM** – At least 256M bytes



ELCSoft Ladder Diagram Mode



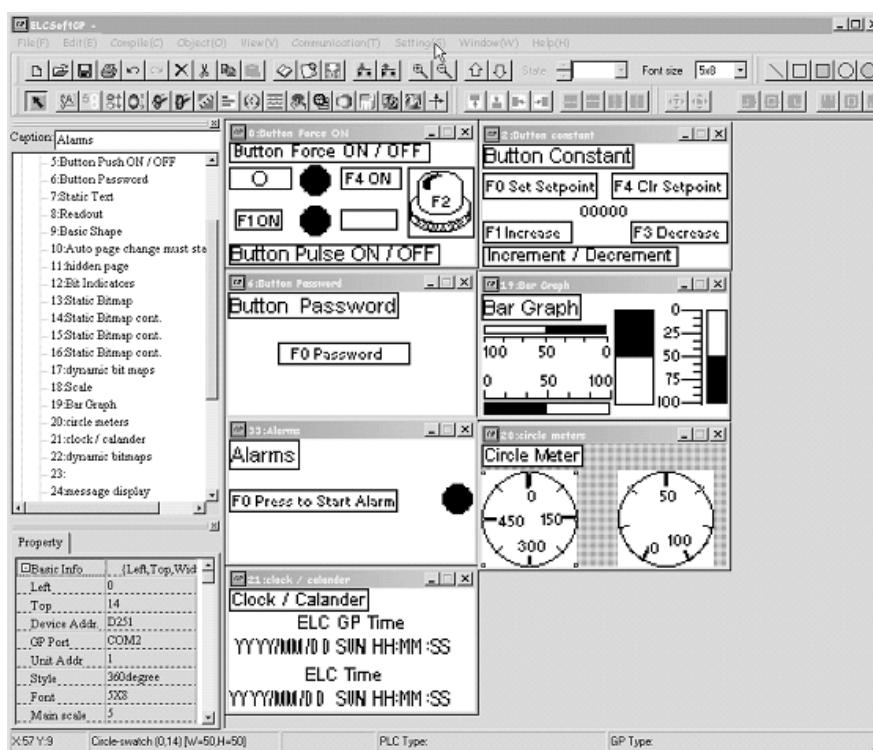
ELCSoft Editor

ELCSoftGP Programming Software

ELCSoftGP Programming Software configures all ELC graphics panels. With ELCSoftGP, applications can be created, edited, downloaded, uploaded, etc. Move programs from one controller to a different one with ease.

Requirements:

- **Operating Systems** – Windows 98, Windows ME, Windows 2000, Windows XP
- **Hard Drive** – At least 100M bytes
- **RAM** – At least 256M bytes



ELCSoftGP Editing Environment

Product Selection

Table 19. Software

Description	Catalog Number	Price U.S. \$
Programming Software for ELC Controllers	ELCSoft	215.
Programming Software for GP Units	ELCSoftGP	215.

Product Family Overview**Contents**

Description	Page
EZ Intelligent Relays	
EZ 500/700/800/EZD Intelligent Relays.....	20
EZD Controller I/O Modules	27
EZ/EZD Expansion Modules	28
EZ/EZD Communication Modules	30
EZ Software	31
EZ/EZD Power Supplies....	32
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**EZ Intelligent Relays Product Family****Product Family Overview**

The EZ intelligent relays bring timers, relays, counters, special functions, inputs and outputs into one compact device that is easily configured. The EZ family of products provides exceptional levels of flexibility together with substantial savings in commissioning time and effort.

The EZ intelligent relays are available in more than 32 different styles that support from 12 I/O up to 320 I/O points providing the ideal solution for lighting, energy management, industrial control, watering, pump control, HVAC and home automation.

Once EZ products are installed, changes are easily accomplished through front panel programming, eliminating the need to change wiring and wiring diagrams increasing the savings realized.

Other terms often used for intelligent relay are relay replacer, control relay and smart relay.

Application Description

Generally where multiple relays, timers and pushbuttons are used there is an opportunity to evaluate switching to the EZ Intelligent Relays. Applications span residential, commercial and industrial installations. Typical applications are:

- Car washes.
- Automatic door control.
- Commercial lighting.
- Residential lighting.
- Exterior lighting.
- Pump control, 12V DC automotive control.
- Greenhouse control.
- Crane control.
- Machinery.
- Paper/pulp.
- Elevator control.
- Livestock feed/gate control.
- Irrigation control.
- Cart chargers.
- Heating and air conditioning.

EZ 500/700/800/EZD Intelligent Relays



EZ 500/700/800/EZD Intelligent Relays

Product Description

Four families make up the EZ Intelligent Relay product line.

EZ500 Series — for controlling small applications with up to 12 input/output signals. Models are available with and without displays. DIN rail mounted.

EZ700 Series — for controlling medium-sized applications with up to 40 input/output signals. DIN rail mounted.

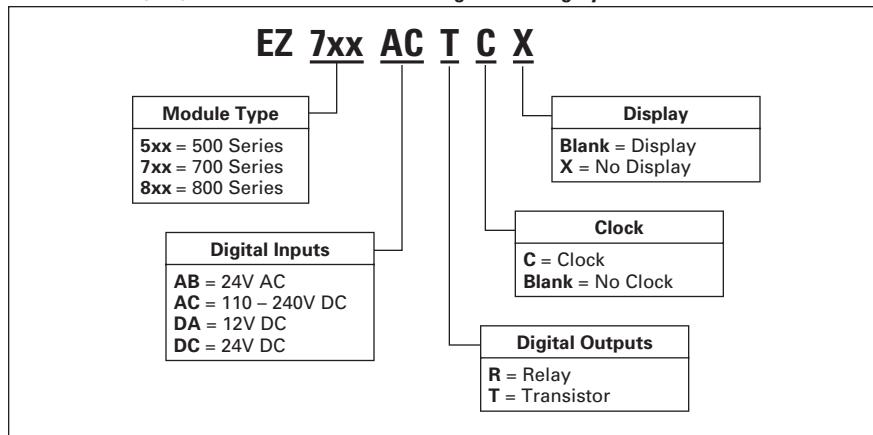
EZ800 Series — for controlling large-scale applications with up to 320 input/output signals. Models are available with and without displays. DIN rail mounted. Use **EZ-NET** for applications beyond 40 I/O.

EZD Series — for controlling large-scale applications with up to 320 input/output signals using powerful visualization functions. The EZD display can be linked to the EZ500/700/800 models to provide an enhanced operator interface. Panel mounted.

The **EZ-NET** integrated network provides easy and inexpensive linking of up to eight EZ800/EZD devices over a distance of up to 1000 meters. The EZ and EZD devices can run their own program or be used as a distributed input/output module. Connect up to 8 controllers each with 40 I/O via a signal expansion module to obtain 320 I/O.

Catalog Number Selection

Table 20. EZ500/700/800 Module Definition Catalog Numbering System



Product Selection



EZ500 with Display



EZ500 without Display

Table 21. EZ500 Intelligent Relays

Description	Inputs					Outputs		Catalog Number	Price U.S. \$
	24V AC	110 – 240V AC	12V DC	24V DC	ALG	RY	TRN		
12 I/O, Clock, Display	8	—	—	—	2	4	—	EZ512-AB-RC	155.
12 I/O, Clock, No Display	8	—	—	—	2	4	—	EZ512-AB-RCX	119.
12 I/O, No Clock, Display	—	8	—	—	—	4	—	EZ512-AC-R	144.
12 I/O, Clock, Display	—	8	—	—	—	4	—	EZ512-AC-RC	155.
12 I/O, Clock, No Display	—	8	—	—	—	4	—	EZ512-AC-RCX	119.
12 I/O, Clock, Display	—	—	8	—	2	4	—	EZ512-DA-RC	155.
12 I/O, Clock, No Display	—	—	8	—	2	4	—	EZ512-DA-RCX	119.
12 I/O, No Clock, Display	—	—	—	8	2	4	—	EZ512-DC-R	144.
12 I/O, Clock, Display	—	—	—	8	2	4	—	EZ512-DC-RC	155.
12 I/O, Clock, No Display	—	—	—	8	2	4	—	EZ512-DC-RCX	119.
12 I/O, Clock, Display	—	—	—	8	2	—	4	EZ512-DC-TC	139.
12 I/O, Clock, No Display	—	—	—	8	2	—	4	EZ512-DC-TCX	119.

Note: Analog inputs optional.

Discount Symbol 2CD-5



EZ700 with Display



EZ700 without Display

Table 22. EZ700 Intelligent Relays

Description	Inputs					Outputs		Catalog Number	Price U.S. \$
	24V AC	110 – 240V AC	12V DC	24V DC	Analog	Relay	Transistor		
18 I/O, Clock, Display	12	—	—	—	4	6	—	EZ719-AB-RC	218.
18 I/O, Clock, No Display	12	—	—	—	4	6	—	EZ719-AB-RCX	187.
18 I/O, Clock, Display	—	12	—	—	—	6	—	EZ719-AC-RC	218.
18 I/O, Clock, No Display	—	12	—	—	—	6	—	EZ719-AC-RCX	187.
18 I/O, Clock, Display	—	—	12	—	4	6	—	EZ719-DA-RC	218.
18 I/O, Clock, No Display	—	—	12	—	4	6	—	EZ719-DA-RCX	187.
18 I/O, Clock, Display	—	—	—	12	4	6	—	EZ719-DC-RC	218.
18 I/O, Clock, No Display	—	—	—	12	4	6	—	EZ719-DC-RCX	187.
20 I/O, Clock, Display	—	—	—	12	4	—	8	EZ721-DC-TC	218.
20 I/O, Clock, No Display	—	—	—	12	4	—	8	EZ721-DC-TCX	187.

Note: Analog inputs optional.



EZ800 with Display



EZ800 without Display

Table 23. EZ800 Intelligent Relays

Description	Inputs			Outputs			Catalog Number	Price U.S. \$
	110 – 240V AC	24V DC	Analog	Relay	Transistor	Analog		
18 I/O, Clock, Display	12	—	—	6	—	—	EZ819-AC-RC	345.
18 I/O, Clock, No Display	12	—	—	6	—	—	EZ819-AC-RCX	301.
18 I/O, Clock, Display	—	12	4	6	—	—	EZ819-DC-RC	345.
18 I/O, Clock, No Display	—	12	4	6	—	—	EZ819-DC-RCX	301.
19 I/O, Clock, Display	—	12	4	6	—	1	EZ820-DC-RC	385.
19 I/O, Clock, No Display	—	12	4	6	—	1	EZ820-DC-RCX	342.
20 I/O, Clock, Display	—	12	4	—	8	—	EZ821-DC-TC	345.
20 I/O, Clock, No Display	—	12	4	—	8	—	EZ821-DC-TCX	301.
21 I/O, Clock, Display	—	12	4	—	8	1	EZ822-DC-TC	385.
21 I/O, Clock, No Display	—	12	4	—	8	1	EZ822-DC-TCX	342.

Note: Analog inputs optional, analog outputs optional.

EZ 500/700/800/EZD Intelligent Relays

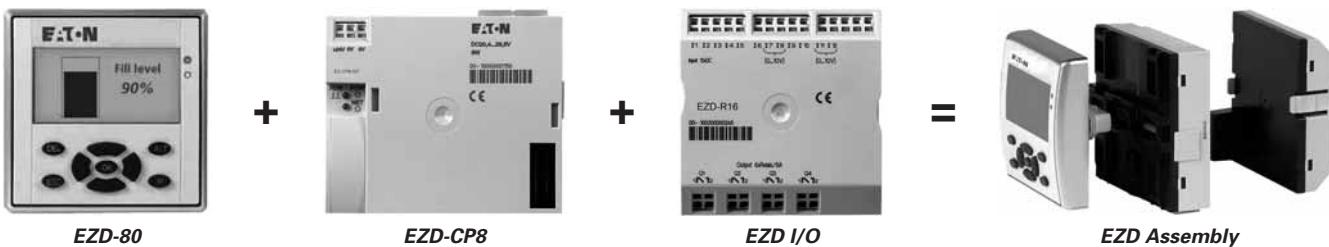


Table 24. EZD Displays (EZD-80) and EZD Controllers (EZD-CP8)

Description	Catalog Number	Price U.S. \$
EZD, No Buttons	EZD-80	116.
EZD, Buttons	EZD-80-B	126.
EZD CPU with 24V DC, Power Supply, Clock	EZD-CP8-ME	283.
EZD CPU with 24V DC, Power Supply, Clock, EZ-Net	EZD-CP8-NT	342.
EZD CPU with 100 – 240V AC, Power Supply, Clock	EZD-AC-CP8-ME	283.
EZD CPU with 100 – 240V AC, Power Supply, Clock, EZ-Net	EZD-AC-CP8-NT	342.

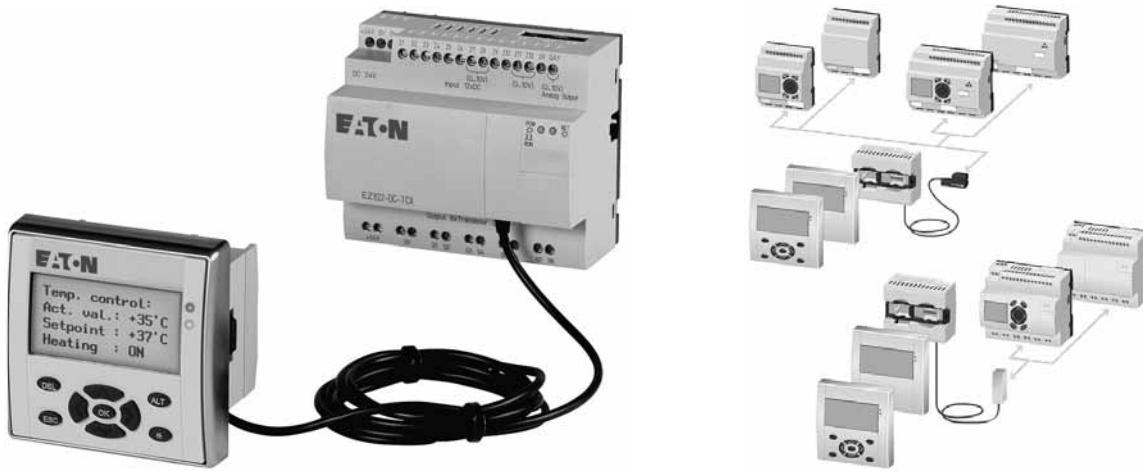


Table 25. EZD Display to EZ Communication Modules (EZD-CP4)

Description	Catalog Number	Price U.S. \$
EZD Display to EZ500/700 DC Communication Module with EZ500/700 Communication Cable (EZD-CP4-500-CAB5)	EZD-CP4-500	104.
EZD Display to EZ800 DC Communication Module with EZ800 Communication Cable (EZD-CP4-800-CAB5)	EZD-CP4-800	104.
EZD Display to EZ500/700 AC Communication Module with EZ500/700 Communication Cable (EZD-CP4-500-CAB5)	EZD-AC-CP4-500	160.
EZD Display to EZ800 AC Communication Module with EZ800 Communication Cable (EZD-CP4-800-CAB5)	EZD-AC-CP4-800	160.

Technical Data and Specifications

Table 26. EZ500 Series

Type	EZ512-AB...	EZ512-AC...	EZ512-DA...	EZ512-DC-RC...	EZ512-DC-TC...
Supply Voltage	24V AC	100 – 240V AC	12V DC	24V DC	24V DC
Heat Dissipation	5 VA	5 VA	2 W	2 W	2 W
Continuous Current Outputs (1)	8 A	8 A	8 A	8 A	0.5 A
Short-circuit Proof with Power Factor 1	Line Protection B16, 600 A			—	—
Short-circuit Proof with Power Factor 0.7...0.7	Line Protection B16, 900 A			—	—
Mounting	On Top-hat Rail to DIN 50022, 35 mm or Screw Mounting with EZB4-101-GF1 Fixing Brackets				

Table 27. EZ700 Series

Type	EZ719-AB...	EZ719-AC...	EZ719-DA...	EZ719-DC-RC...	EZ721-DC-TC...
Supply Voltage	24V AC	100 – 240V AC	12V DC	24V DC	24V DC
Heat Dissipation	7 VA	10 VA	3.5 W	3.5 W	3.5 W
Continuous Current Outputs (1)	8 A	8 A	8 A	8 A	0.5 A
Short-circuit Proof with Power Factor 1	Line protection B16, 600 A			—	—
Short-circuit Proof with Power Factor 0.7...0.7	Line protection B16, 900 A			—	—
Mounting	On Top-hat Rail to DIN 50022, 35 mm or Screw Mounting with EZB4-101-GF1 Fixing Brackets				

Table 28. EZ800 Series

Type	EZ819-AC...	EZ819-DC-RC.	EZ820-DC-RC.	EZ821-DC-TC.	EZ822-DC-TC.
Supply Voltage	100 – 240V AC	24V DC	24V DC	24V DC	24V DC
Heat Dissipation	10 VA	3.4 W	3.4 W	3.4 W	3.4 W
Continuous Current Outputs (1)	8 A	8 A	8 A	8 A	0.5 A
Short-circuit Proof with Power Factor 1	Line protection B16, 600 A			—	—
Short-circuit Proof with Power Factor 0.7...0.7	Line protection B16, 900 A			—	—
Mounting	On Top-hat Rail to DIN 50022, 35 mm or Screw Mounting with EZB4-101-GF1 Fixing Brackets				

Table 29. EZD CP4 and CP8 Modules

Type	EZD-80...	EZD-CP4-...	EZD-CP8...	EZD-AC-CP8...
Supply Voltage	Supply from -CP	24V DC	24V DC	100 – 240V AC
Heat Dissipation	3 W	1.5 W	3 W	8 VA
Mounting	Front Mounting in 2 x 22.5 mm Standard Drill Holes	Snap Fitted to EZD-80	Snap Fitted to EZD-80 or on Top-hat Rail to DIN 50022, 35 mm or Screw Mounting with EZB4-101-GF1 Fixing Brackets	

Table 30. EZ500, EZ700, EZ800, EZD-80, EZD-CP4, EZD-CP8 Modules

Type	EZD-80...	EZ500/700/800, EZD-CP4/CP8
Connection Cables	—	0.2 – 4.0 mm ² (AWG 22-12), solid 0.2 - 2.5 mm ² (AWG 22-12), flexible
Degree of Protections	IP65	IP 20
RFI Suppression	EN 55011, EN 55022 Class B, IEC 61000-6-1,2,3,4	EN 55011, EN 55022 Class B, IEC 61000-6-1,2,3,4
Ambient Operating Temperature	Clearly Legible at -5 to 50°C	-25 to 55°C
Transport and Storage Temperature	-40 to 70°C	-40 to 70°C
Certification, Standards	EN 50178, IEC/EN 60947, UL®, CSA®	EN 50178, IEC/EN 60947, UL, CSA

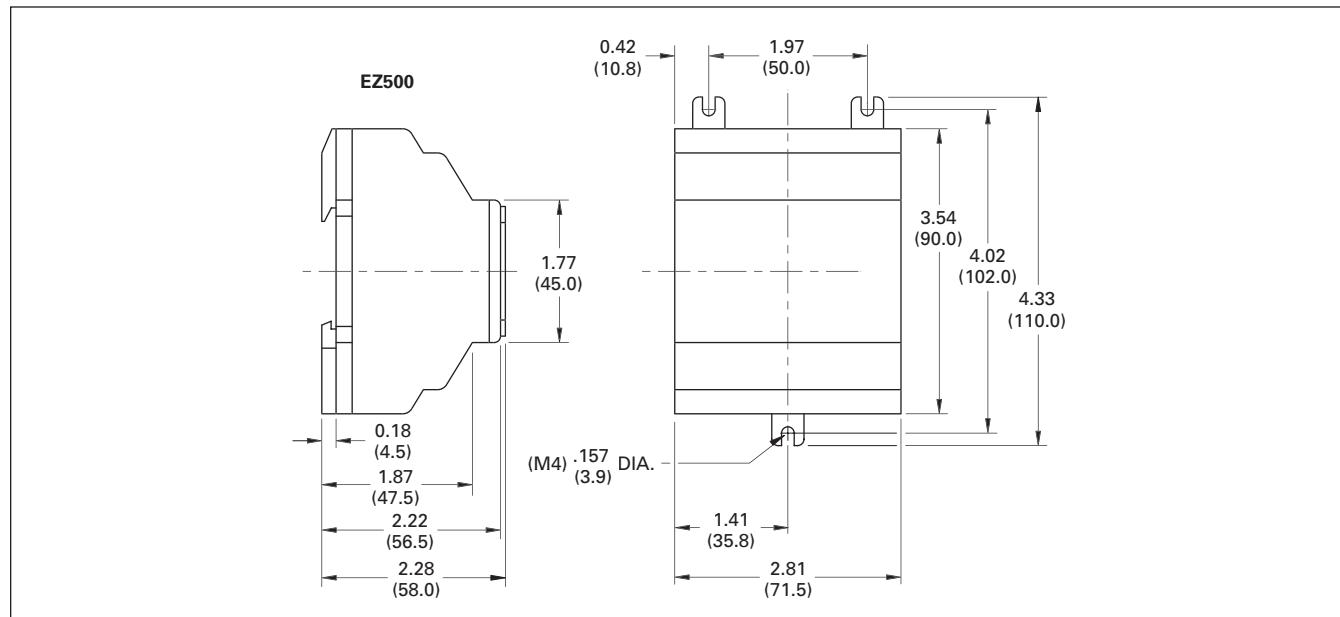
Dimensions

Figure 18. EZ500 Series Dimensions in Inches (mm), Drawing Number MD05013001E

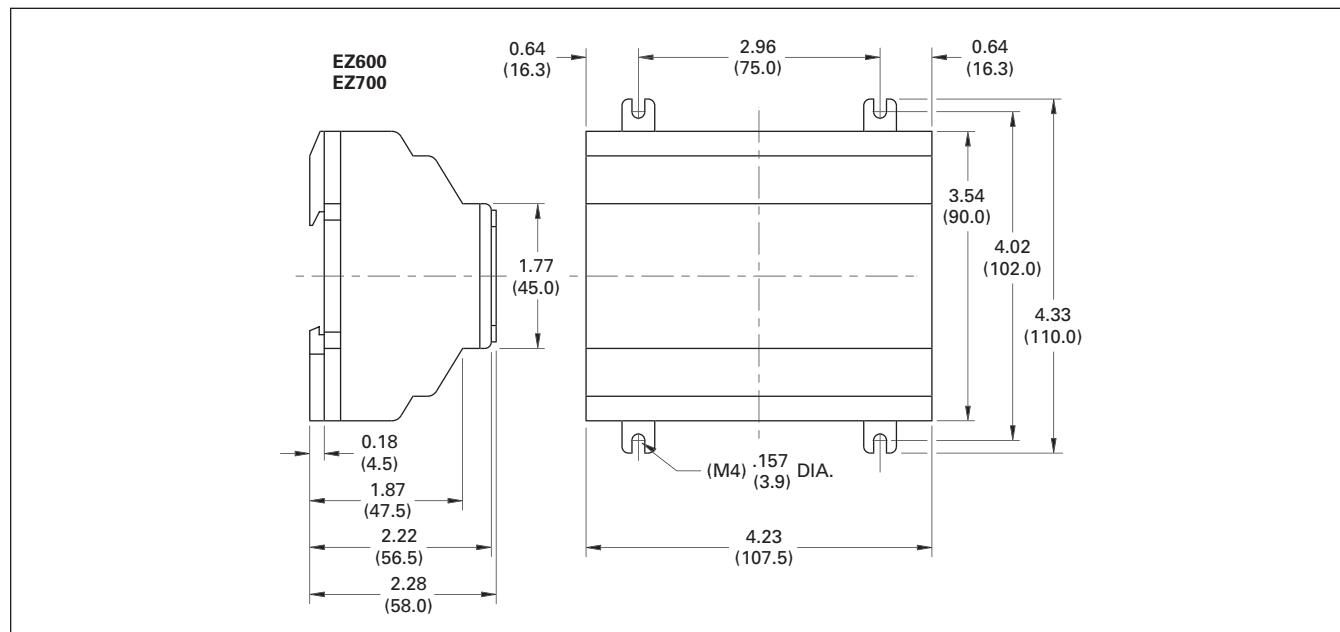
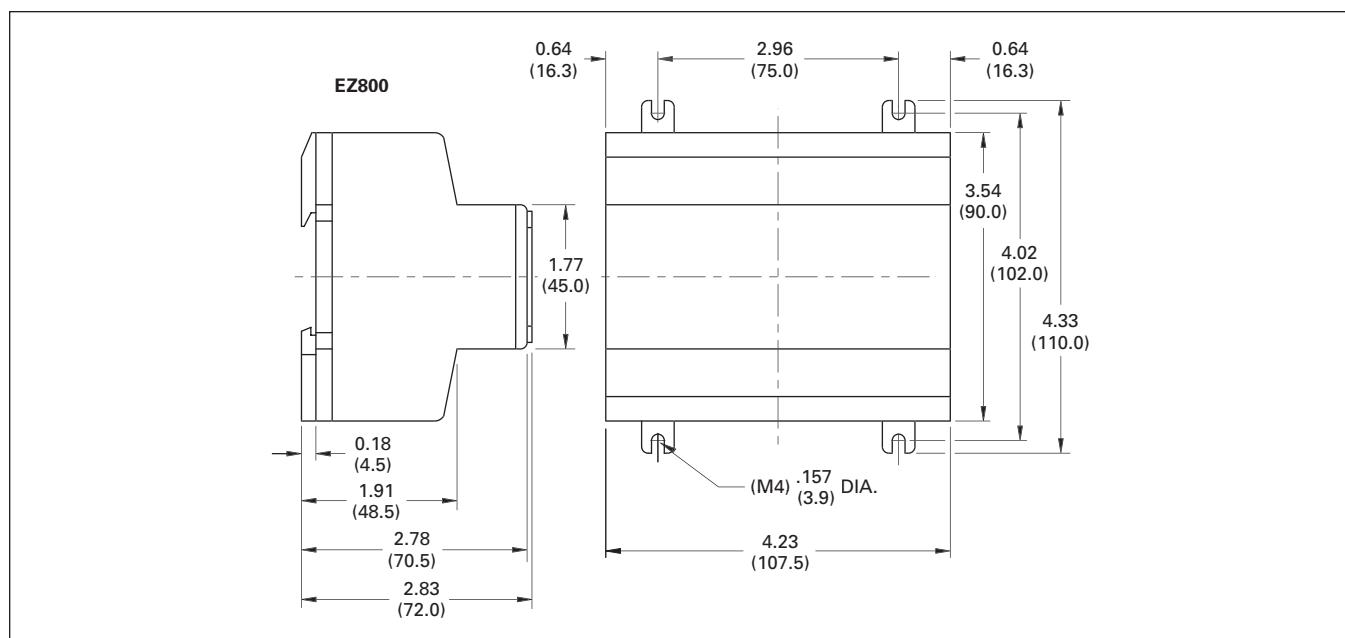
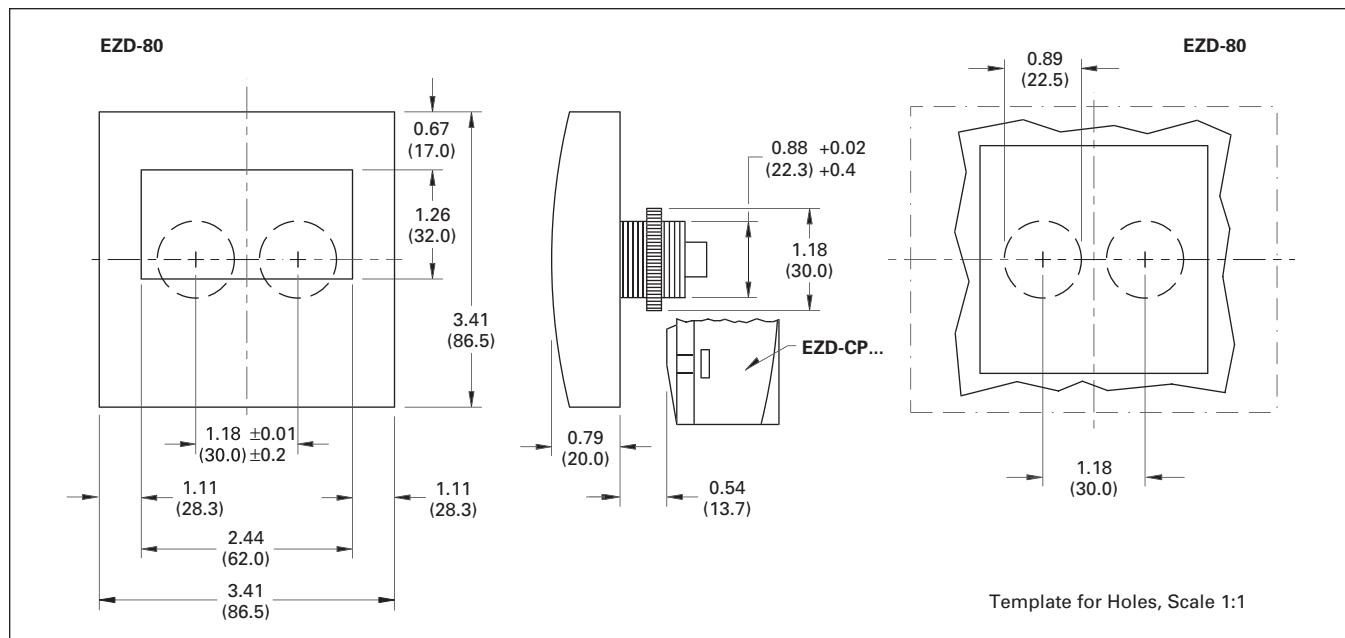


Figure 19. EZ600 and EZ700 Series Dimensions in Inches (mm), Drawing Number MD05013002E

May 2007

EZ 500/700/800/EZD Intelligent Relays**Figure 20. EZ800 Series Dimensions in Inches (mm), Drawing Number MD05013003E****Figure 21. EZD-80 Series Dimensions in Inches (mm), Drawing Number MD05013005E**

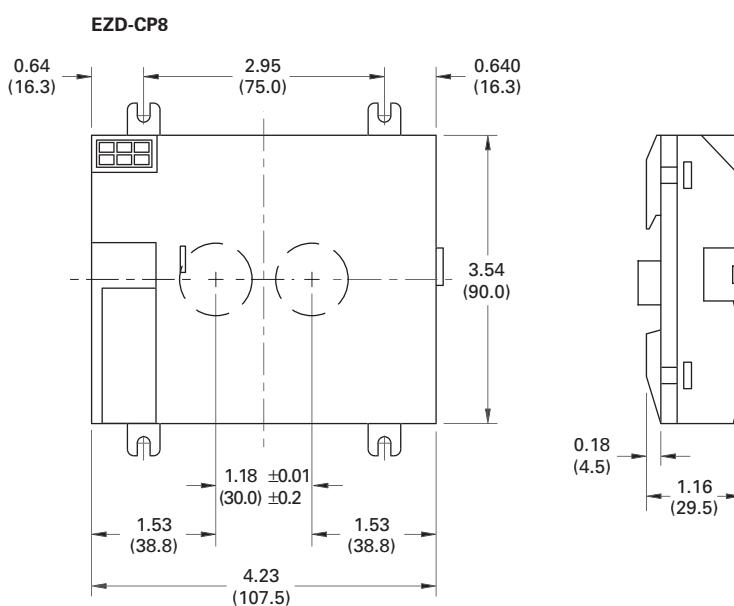


Figure 22. EZD-CP8 Series Dimensions in Inches (mm), Drawing Number MD05013006E

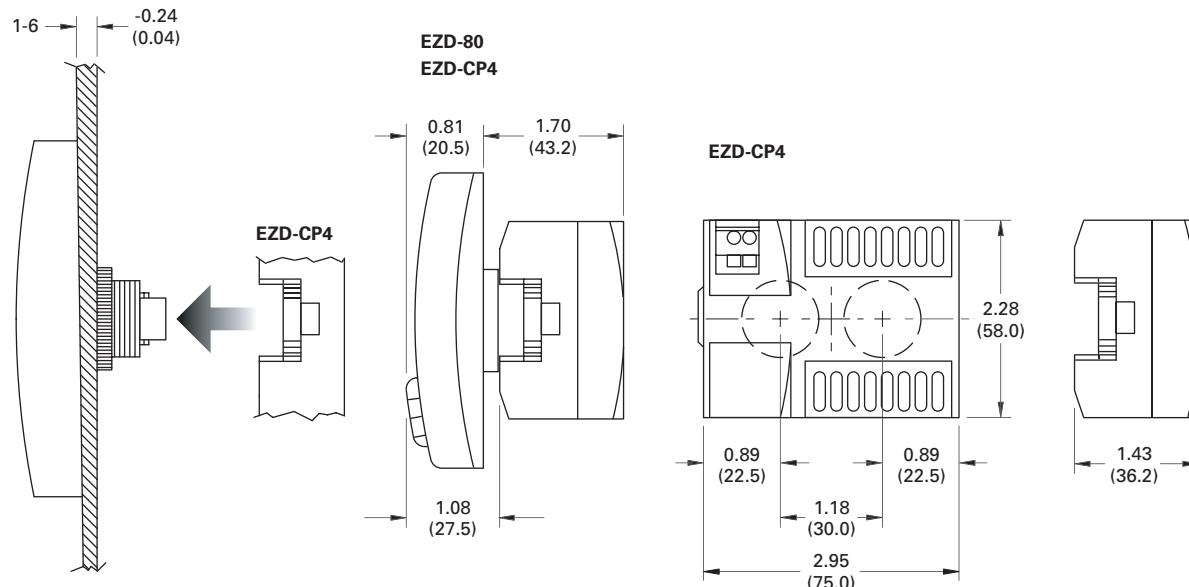


Figure 23. EZD-CP4, EZD-80 and EZD-CP4 Series Combined Dimensions in Inches (mm), Drawing Number MD013013E

EZD Controller I/O Modules

Product Selection

Table 31. EZD Controller I/O Modules

Description	Inputs			Outputs			Catalog Number	Price U.S. \$
	110 – 240V AC	24V DC	Analog	Relay	Transistor	Analog		
16 I/O	12	—	—	4	—	—	EZD-AC-R16	120.
16 I/O	—	12	4	4	—	—	EZD-R16	120.
17 I/O	—	12	4	4	—	1	EZD-RA17	156.
16 I/O	—	12	4	—	4	—	EZD-T16	120.
17 I/O	—	12	4	—	4	1	EZD-TA17	156.

Note: Analog inputs optional.

Technical Data and Specifications

Table 32. EZD Specifications

Type	EZD-AC-R16	EZD-R16	EZD-RA17	EZD-T16	EZD-TA17
Supply Voltage	Supply via EZD-CP8 module				
Heat Dissipation	0.5 W	0.5 W	0.5 W	0.5 W	0.5 W
Continuous Current Outputs ①	8 A	8 A	8 A	0.5 A	0.5 A
Short-circuit Proof with Power Factor 1	Line protection B16, 600 A			—	—
Short-circuit Proof with Power Factor 0.7...0.7	Line protection B16, 900 A			—	—
Connection Cables	0.2 – 4.0 mm ² (AWG 22-12), Solid 0.2 – 2.5 mm ² (AWG 22-12), Flexible				
Degree of Protections	IP 20	IP 20	IP 20	IP 20	IP 20
RFI Suppression	EN 55011, EN 55022 Class B, IEC 61000-6-1,2,3,4				
Ambient Operating Temperature	-25 to 55°C	-25 to 55°C	-25 to 55°C	-25 to 55°C	-25 to 55°C
Transport and Storage Temperature	-40 to 70°C	-40 to 70°C	-40 to 70°C	-40 to 70°C	-40 to 70°C
Certification, Standards	EN 50178, IEC/EN 60947, UL, CSA				
Mounting	Snap Fitted to EZD-CP8 Module				

① Relay = 8 A (10 A to UL) with resistive load, 3 A with inductive load/transistor outputs = 0.5 A/24V DC, max 4 outputs switchable in parallel.

Dimensions

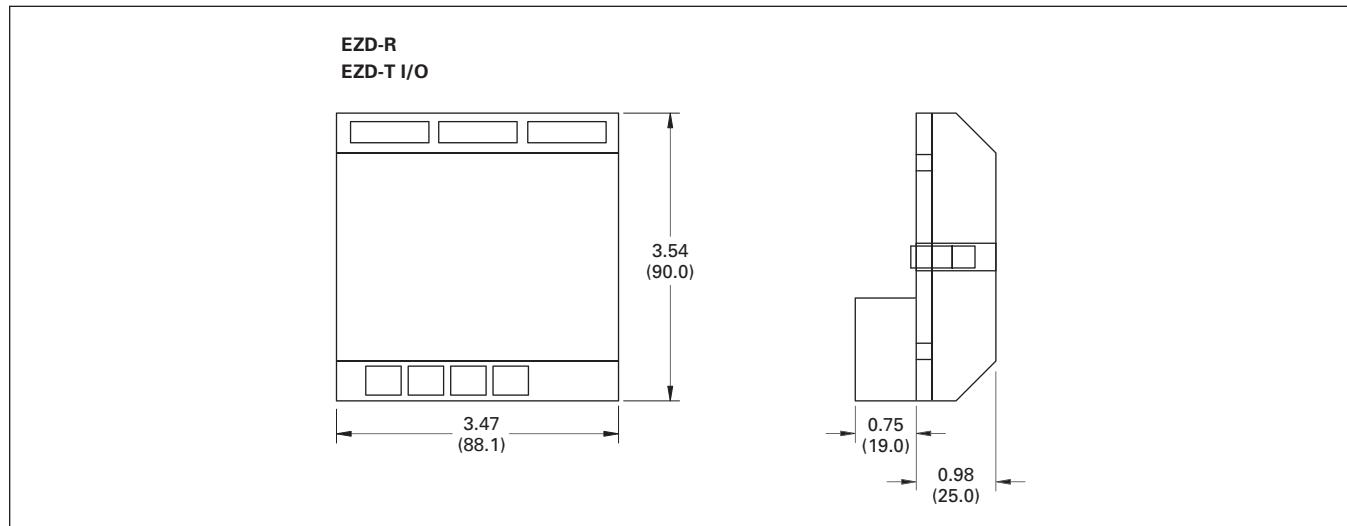
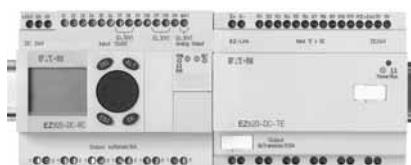


Figure 24. EZD-R/EZD-T I/O Module Dimensions in Inches (mm), Drawing Number MD05013007E



EZ/EZD Expansion Modules

EZ/EZD Expansion Modules

Expansion modules are available for increasing the input/output of the EZ700/800 and EZD intelligent relays to 24 inputs and up to 16 outputs. Expansion modules can be mounted directly to the EZ/EZD unit or up to 98 ft. (30 m) away using coupling module EZ200-EZ.

Product Description

Product Selection

Table 33. EZ/EZD I/O Expansion Modules ①

Description	Inputs		Outputs		Catalog Number	Price U.S. \$
	110 – 240V AC	24V DC	RY	TRN		
2 I/O Expansion	—	—	2	—	EZ202-RE	52.
18 I/O Expansion	12	—	6	—	EZ618-AC-RE	152.
18 I/O Expansion	—	12	6	—	EZ618-DC-RE	152.
20 I/O Expansion	—	12	—	8	EZ620-DC-TE	152.
Coupling Module for Remote Mounting of Expansion Modules					EZ200-EZ	41.

① All expansion modules include one EZ-LINK-DS.

Technical Data and Specifications

Table 34. EZ Specifications

Type	EZ202-RE	EZ618-AC-RE	EZ618-DC-RE	EZ620-DC-TE	EZ200EZ
Supply Voltage	—	100 – 240V AC	24V AC	24V AC	—
Heat Dissipation	1 W	10 VA	4 W	4 W	1 W
Continuous Current Outputs ②	8 A	8 A	8 A	0.5 A	—
Short-circuit Proof with Power Factor 1	Line Protection B16, 600 A				—
Short-circuit Proof with Power Factor 0.7...0.7	Line Protection B16, 900 A				—
Connection Cables	0.2 – 4.0 mm ² (AWG 22-12), Solid 0.2 – 2.5 mm ² (AWG 22-12), Flexible				
Degree of Protections	IP 20	IP 20	IP 20	IP 20	IP 20
RFI Suppression	EN 55011, EN 55022 Class B, IEC 61000-6-1,2,3,4				
Ambient Operating Temperature	-25 to 55°C	-25 to 55°C	-25 to 55°C	-25 to 55°C	-25 to 55°C
Transport and Storage Temperature	-40 to 70°C	-40 to 70°C	-40 to 70°C	-40 to 70°C	-40 to 70°C
Certification, Standards	EN 50178, IEC/EN 60947, UL, CSA				
Mounting	On Top-hat Rail to DIN 50022, 35 mm or Screw Mounting with EZB4-101-GF1 Fixing Brackets				

② Relay = 8A (10 A to UL) with resistive load, 3 A with inductive load/transistor outputs = 0.5 A/24V DC, max 4 outputs switchable in parallel.

Dimensions

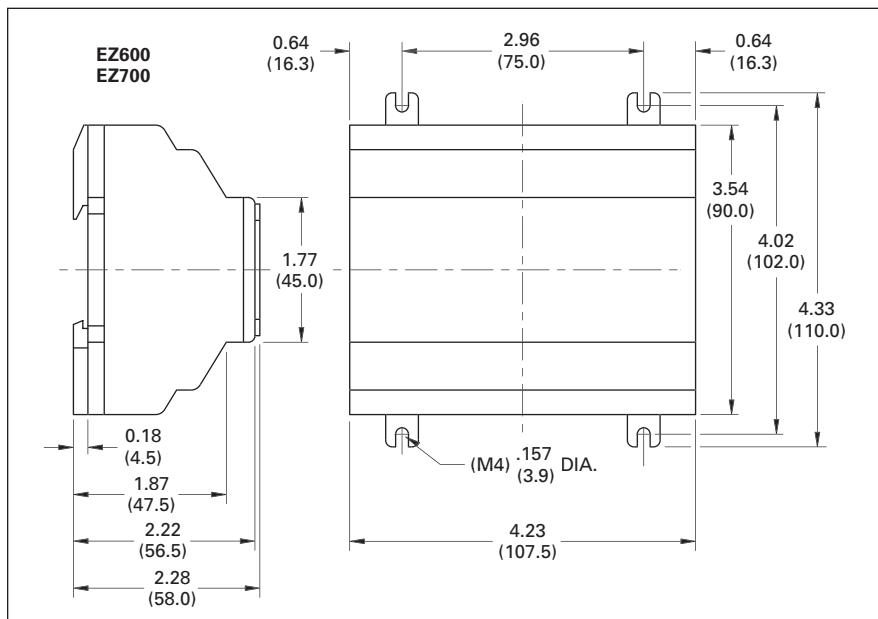
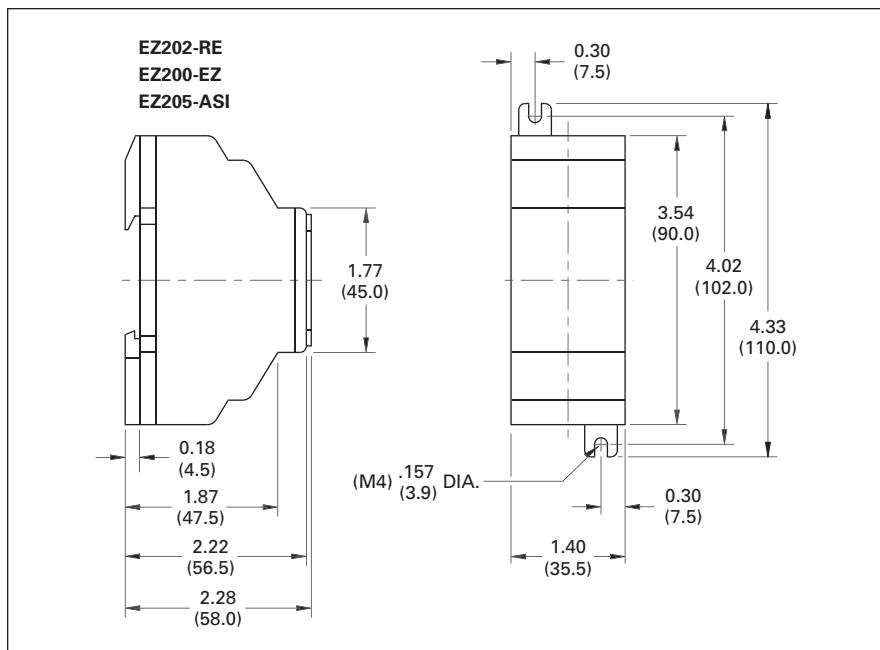


Figure 25. EZ600 and EZ700 Series Dimensions in Inches (mm), Drawing Number MD05013002E

Discount Symbol 2CD-5



**Figure 26. EZ202-RE/EZ200-EZ/EZ205-ASI Series Dimensions in Inches (mm), Drawing Number
MD05013012E**

EZ/EZD Communication Modules



EZ204-DP Communication Module

Product Description

Four modules are available for easily connecting to world-standard networks. The communication modules can be used with the EZ700/800 and EZD intelligent relays.

Available communication modules support:

- PROFIBUS-DP
- AS-I (Actuator Sensor Interface) networks
- CANopen
- DeviceNet
- Ethernet/IP

All modules act as a gateway and operate exclusively as a slave station on the network.

Product Selection

Table 35. EZ/EZD Communication Interface Modules

Description	Catalog Number	Price U.S. \$
PROFIBUS-DP Slave Interface Module	EZ204-DP	257.
AS-Interface Slave with 4 In and 4 Out Interface Module	EZ205-ASI	94.
CANopen Interface Module	EZ221-CO	247.
DeviceNet Slave Interface Module	EZ222-DN	247.
Ethernet/IP Gateway	EZ209-SE	289.

Technical Data and Specifications

Table 36. EZ/EZD Specifications

Type	EZ204-DP	EZ205-ASI	EZ221-CO	EZ222-DN
Supply Voltage	24V DC	24V DC	24V DC	24V DC
Heat Dissipation	2 W	1 W	1 W	1 W
Connection Cables	0.2 – 4.0 mm ² (AWG 22-12), Solid 0.2 – 2.5 mm ² (AWG 22-12), Flexible			
Degree of Protections	IP 20	IP 20	IP 20	IP 20
RFI Suppression	EN 55011, EN 55022 Class B, IEC 61000-6-1,2,3,4			
Ambient Operating Temperature	-25 to 55°C	-25 to 55°C	-25 to 55°C	-25 to 55°C
Transport and Storage Temperature	-40 to 70°C	-40 to 70°C	-40 to 70°C	-40 to 70°C
Certification, Standards	EN 50178, IEC/EN 60947, UL, CSA			
Mounting	On Top-hat Rail to DIN 50022, 35 mm or Screw Mounting with EZB4-101-GF1 Fixing Brackets			

Dimensions

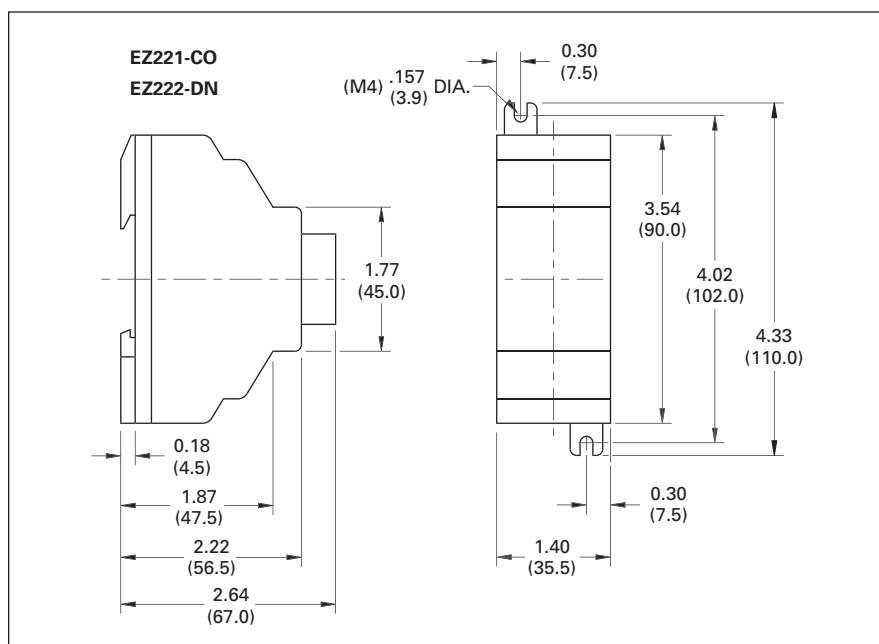


Figure 27. EZ221-CO/EZ222-DN Series Dimensions in Inches (mm), Drawing Number MD05013010E

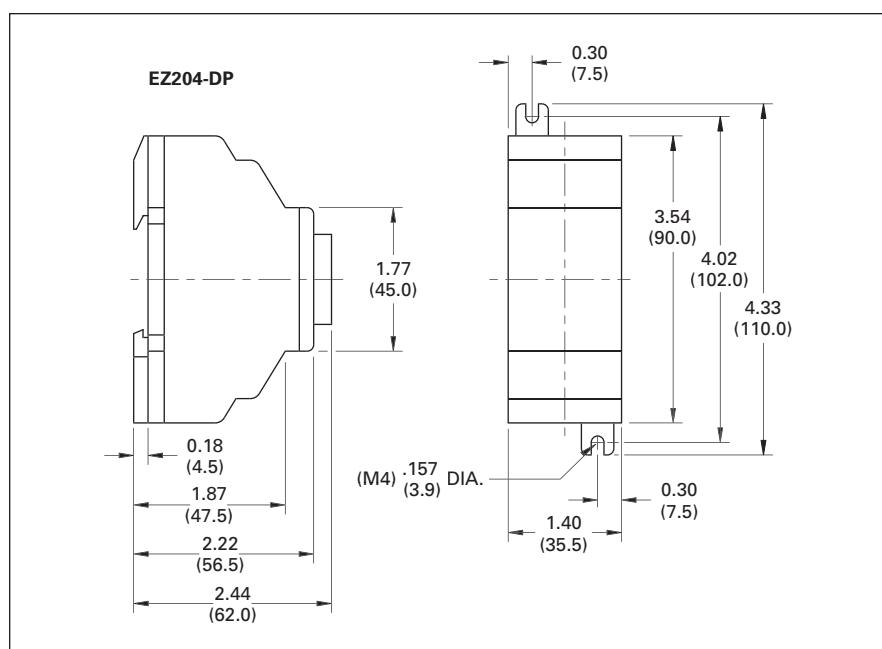


Figure 28. EZ204-DP Series Dimensions in Inches (mm), Drawing Number MD05013011E

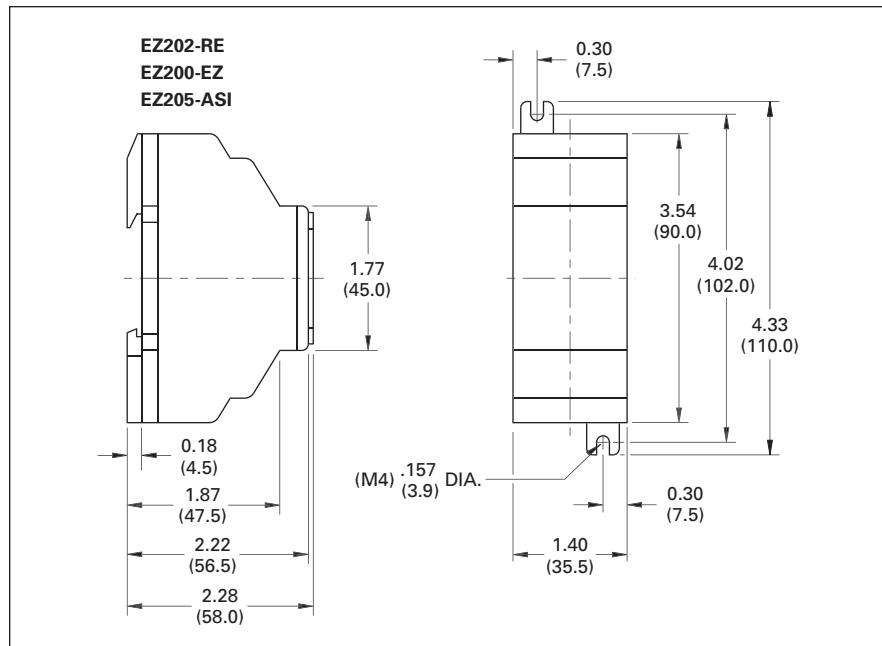


Figure 29. EZ202-RE/EZ200-EZ/EZ205-ASI Series Dimensions in Inches (mm), Drawing Number MD05013012E

EZ Software



EZSoft Software

Product Description

The EZSoft software is used to program all of the EZ and EZD controllers and displays. The Windows-based software provides straightforward circuit diagram input and editing and the diagrams can be displayed in the format desired. When EZ800 and EZD controllers are connected using EZ-NET, all connected devices can be accessed and their programs loaded from a single controller.

EZSoft includes an integrated offline simulation tool that allows users to test a circuit diagram before commissioning.

Product Selection

Table 37. EZ/EZD Software

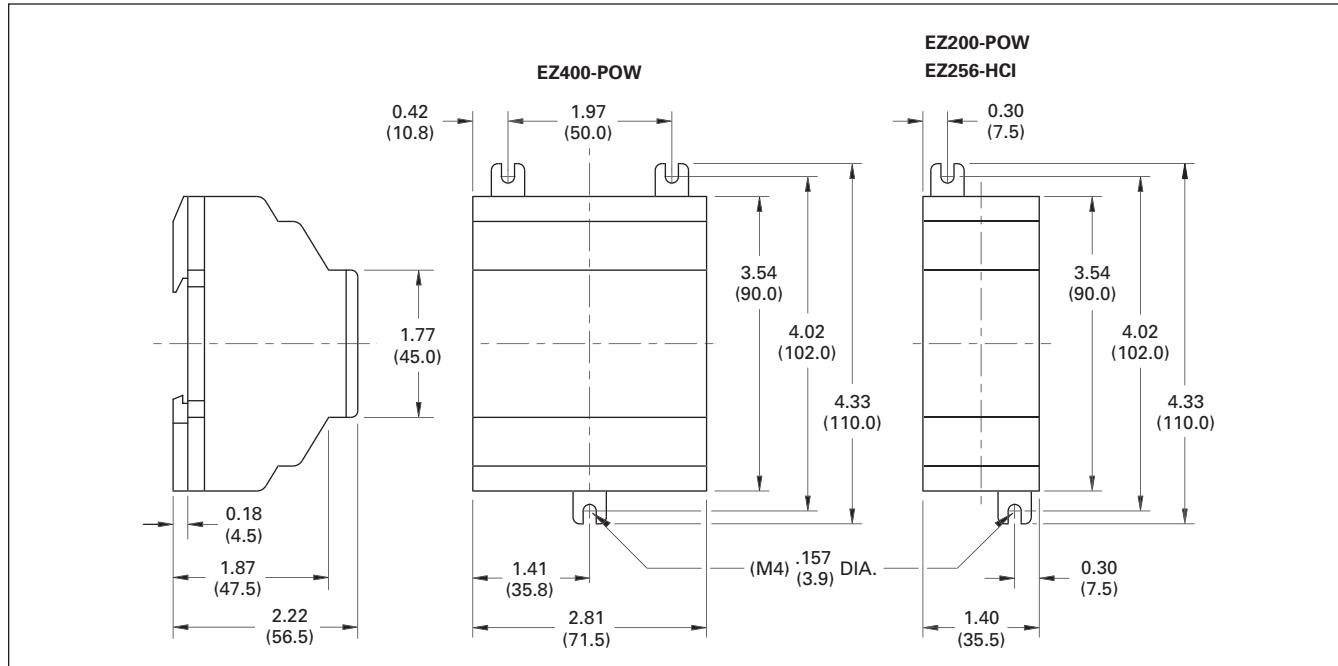
Description	Catalog Number	Price U.S. \$
Programming Software for EZ500/700/800 and EZD	EZSOFT	195.

EZ/EZD Power Supplies**Product Selection****Table 38. EZ/EZD-CP8 Power Supplies**

Description	Catalog Number	Price U.S. \$
100 – 240V AC Input to 12V DC at 20 mA/24V DC at 250 mA	EZ200-POW	41.
100 – 240V AC Input to 24V DC at 1.25 A	EZ400-POW	68.

Technical Data and Specifications**Table 39. EZ Specifications**

Type	EZ200-POW	EZ400-POW
Supply Voltage	100 – 240V AC	100 – 240V AC
Maximum Range	85 – 264V AC	85 – 264V AC
Output Voltage	24V DC ($\pm 3\%$)	24V DC ($\pm 3\%$)
Output Current (Rated Value)	0.25 A	1.25 A
Overshoot Limitation Form	0.3 A	1.4 A
Short-circuit Proof (Secondary)	YES	YES
Overload Proof	YES	YES
Potential Isolation (prim/sec.)	YES, SELV, (to EN 600950, VDE 805)	YES, SELV, (to EN 600950, VDE 805)
Others	Additional Output Voltage 12 dc, 20 mA	Additional Output Voltage 12 dc, 20 mA
Connection Cables	0.2 – 4.0 mm ² (AWG 22-12), Solid 0.2 – 2.5 mm ² (AWG 22-12), Flexible	0.2 – 4.0 mm ² (AWG 22-12), Solid 0.2 – 2.5 mm ² (AWG 22-12), Flexible
Degree of Protections	IP 20	IP 20
RFI Suppression	EN 55011, EN 55022 Class B, IEC 61000-6-1, 2, 3, 4	EN 55011, EN 55022 Class B, IEC 61000-6-1, 2, 3, 4
Ambient Operating Temperature	-25 to 55°C	-25 to 55°C
Transport and Storage Temperature	-40 to 70°C	-40 to 70°C
Certification, Standards	EN 50178, IEC/EN 60947, UL, CSA	EN 50178, IEC/EN 60947, UL, CSA
Mounting	On Top-hat Rail to DIN 50022, 35 mm or Screw Mounting with EZB4-101-GF1 Fixing Brackets	

Dimensions**Figure 30. EZ200-POW/EZ256-HCI and EZ400-POW Series Dimensions in Inches (mm), Drawing Number MD05013004E**

Discount Symbol 2CD-5

EZ/EZD Accessories

EZ/EZD Accessories



EZ700/500 Panel Window and Mounting Kit

Product Selection

Table 40. EZ/EZD Memory Storage Modules

Description	Catalog Number	Price U.S. \$
EZ500/700 32K Memory Storage Module	EZ-M-32K	22.
EZ800/EZD 256K Memory Storage Module	EZ-M-256K	33.

Table 41. EZ/EZD Programming Cables

Description	Catalog Number	Price U.S. \$
EZ500/700 to PC Cable	EZ-PC-CAB	56.
EZ800/EZD to PC Cable	EZ800-PC-CAB	82.

Dimensions

Table 42. EZ/EZD Cables and Connectors

Description	Catalog Number	Price U.S.
EZ500/700 to EZD-CP4 Communication Cable, 5 m	EZD-CP4-500-CAB5	50.
EZ800 to EZD-CP8 Communication Cable, 2 m	EZD-800-CAB	54.
EZ800 to EZD-CP8 Communication Cable, 5 m	EZD-800-CAB5	92.
EZ800 to EZD-CP4 Communication Cable, 5 m	EZD-CP4-800-CAB5	50.
EZ800/EZD EZ-NET Cable, 0.3 m	EZ-NT-30	9.
EZ800/EZD EZ-NET Cable, 0.8 m	EZ-NT-80	14.
EZ800/EZD EZ-NET Cable, 1.5 m	EZ-NT-150	21.
EZ800/EZD Network Termination Resistor, 2/Pack	EZ-NT-R	25.
EZ800/EZD EZ-NET Cable (cable only, no connectors, see EZ-NT-RJ45), 100 m	EZ-NT-CAB	162.
RJ45 Network Connectors for EZ-NET Cable (EZ-NT-CAB), 10/Pack	EZ-NT-RJ45	4.

Table 43. EZ/EZD Miscellaneous Parts

Description	Catalog Number	Price U.S.
EZ500 Relay Simulator	EZ412-DC-SIM-NA	150.
EZ500 Panel Window	EZSKF-FF4	18.
EZ700/800 Panel Window	EZSKF-FF6	21.
EZ500/700/800 Panel Window Mounting Kit to Front Mount Units	EZSKF-HA	9.
EZ/EZD Panel Mount Brackets, 9/Pack	EZB4-101-GF1	13.
EZ/EZD Grounding Kit	EZB4-102-KS1	17.
EZD Display DIN Rail Mount Kit	EZD-TS144	10.
EZD Display Protective Membrane Cover	EZD-XM-80	28.
EZD Display Protective Plastic Cover	EZD-XS-80	28.
EZ/EZD 6 Channel Noise Suppression Adapter	EZ256-HCI	34.
EZ/EZD Spare Interface Connector, Base to Expander	EZ-LINK-DS	5.
EZSoft Configuration Software	EZSOFT	195.
EZ Starter Kit (includes EZ512-DC-RC, EZ-PC-CAB, EZ412-DC-SIM-NA, EZSoft)	EZSTARTKIT1	475.

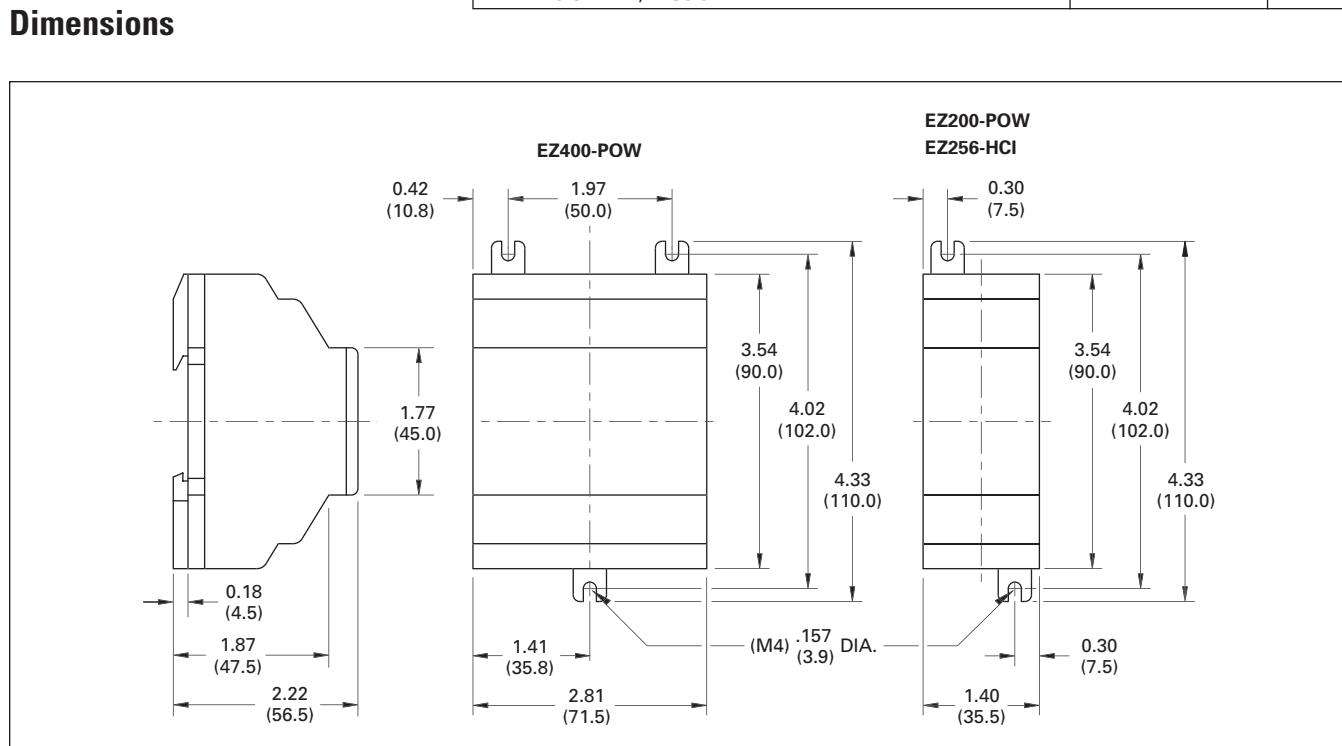
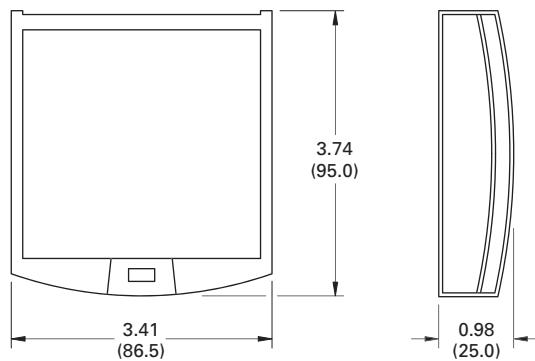


Figure 31. EZ200-POW/EZ256-HCI and EZ400-POW Series Dimensions in Inches (mm), Drawing Number MD05013004E

EZD-XS-80



EZD-XM-80

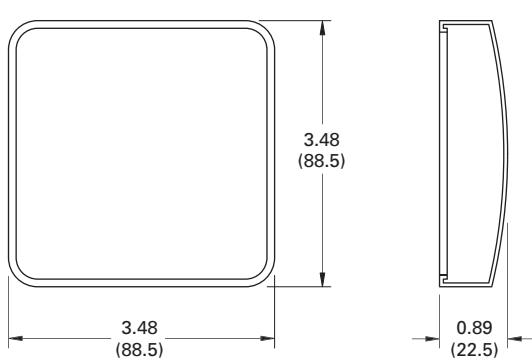


Figure 32. EZD-XS-80 and EZD-XM-80 Series Dimensions in Inches (mm), Drawing Number MD05013009E

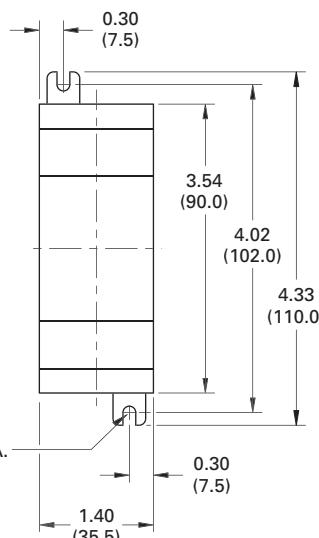
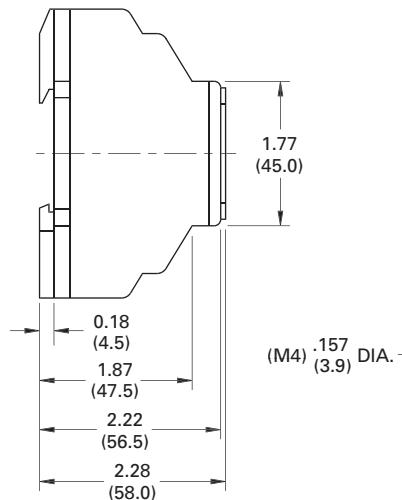
EZ202-RE
EZ200-EZ
EZ205-ASI

Figure 33. EZ202-RE/EZ200-EZ/EZ205-ASI Series Dimensions in Inches (mm), Drawing Number MD05013012E

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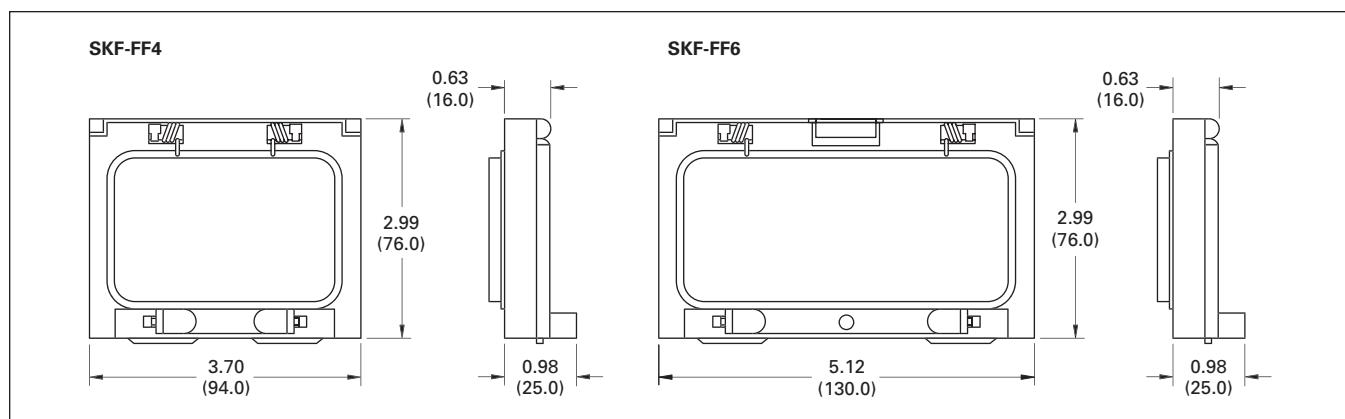
EZ/EZD Accessories

Figure 34. EZSKF-FF4 and EZSKF-FF6 Series Dimensions in Inches (mm), Drawing Number MD05013014E

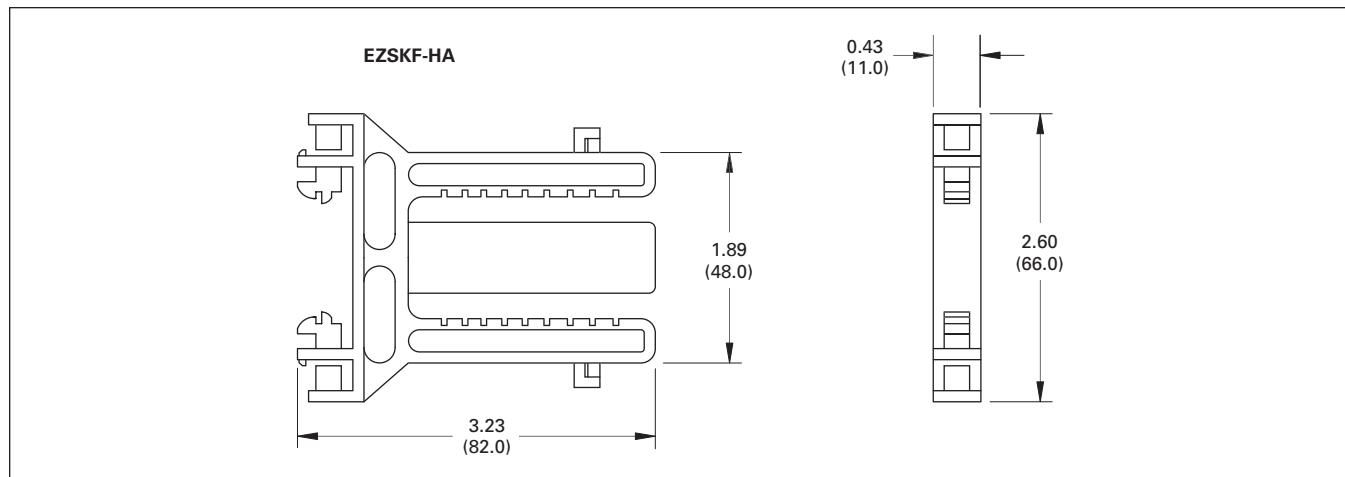


Figure 35. EZSKF-HA Series Dimensions in Inches (mm), Drawing Number MD05013015E

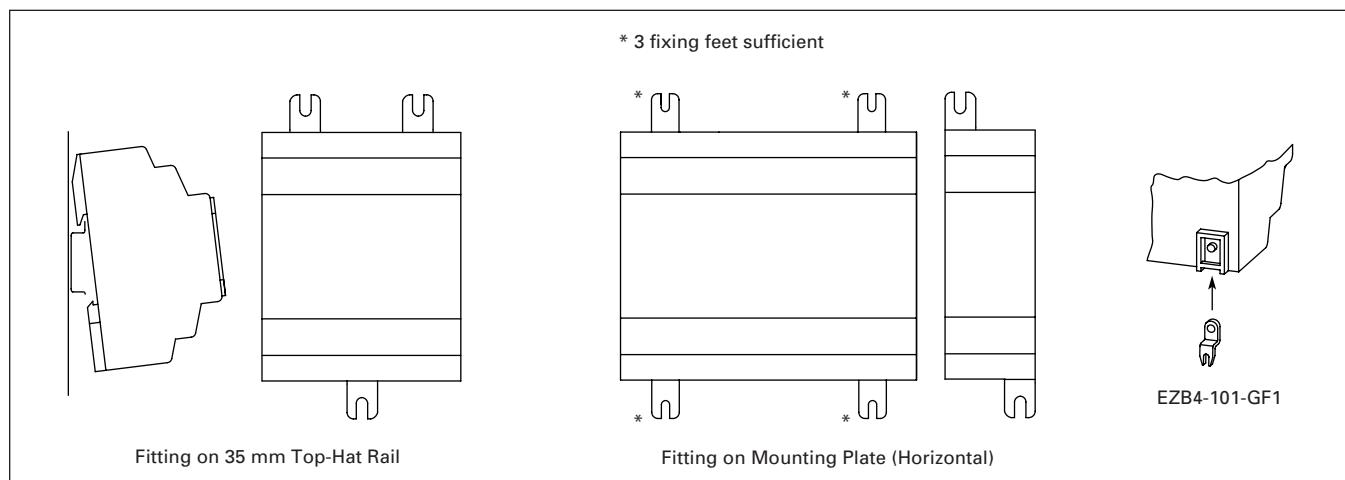


Figure 36. EZB4-101-GF1 Series

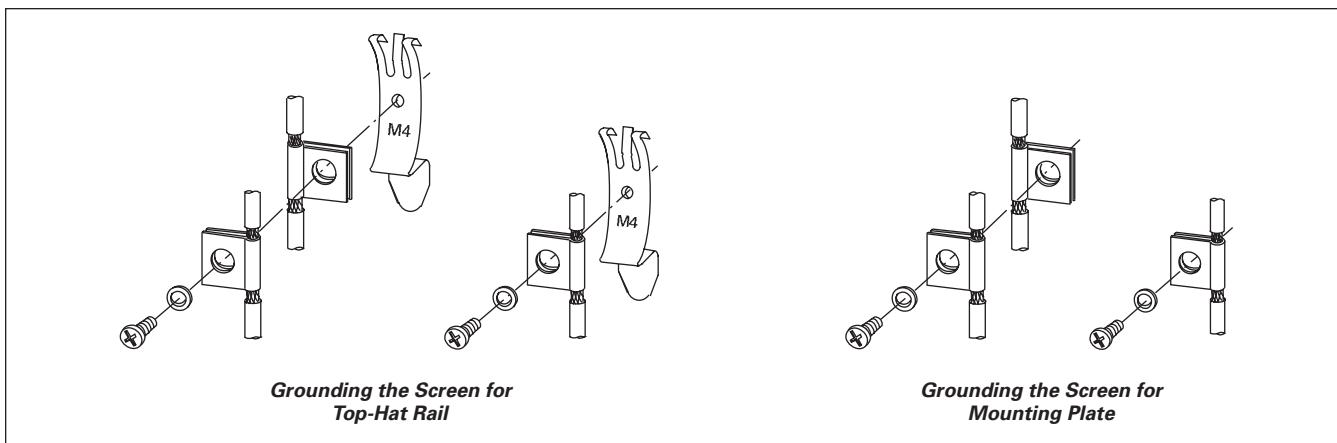


Figure 37. EZB4-102-KS1 Series

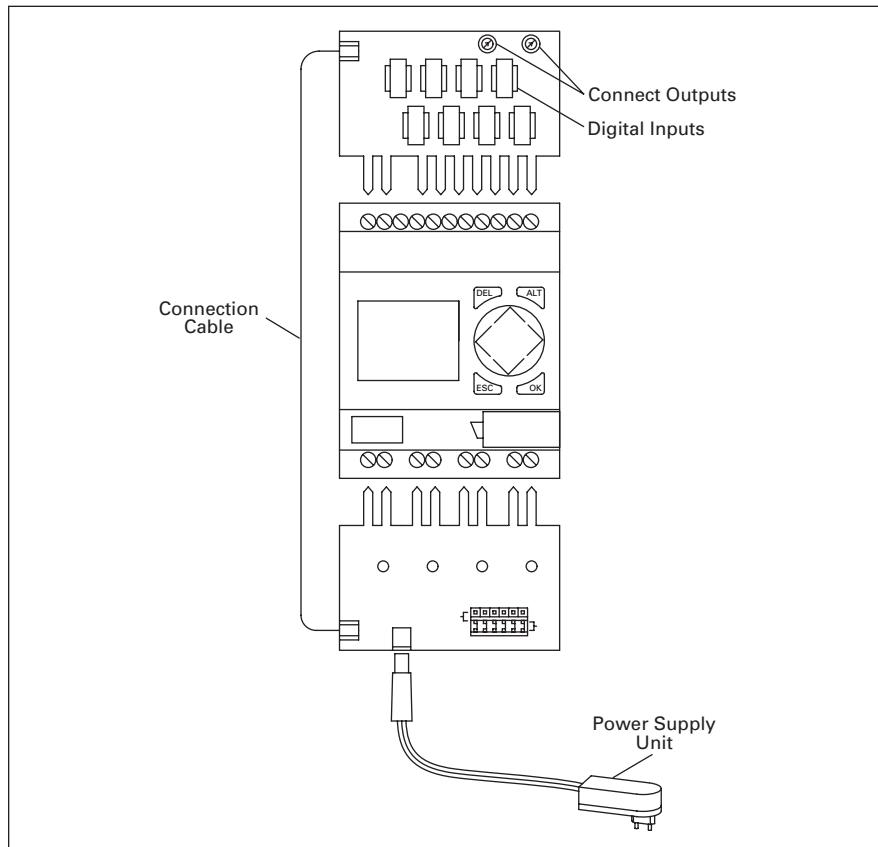


Figure 38. EZ412-DC-SIM-NA Series

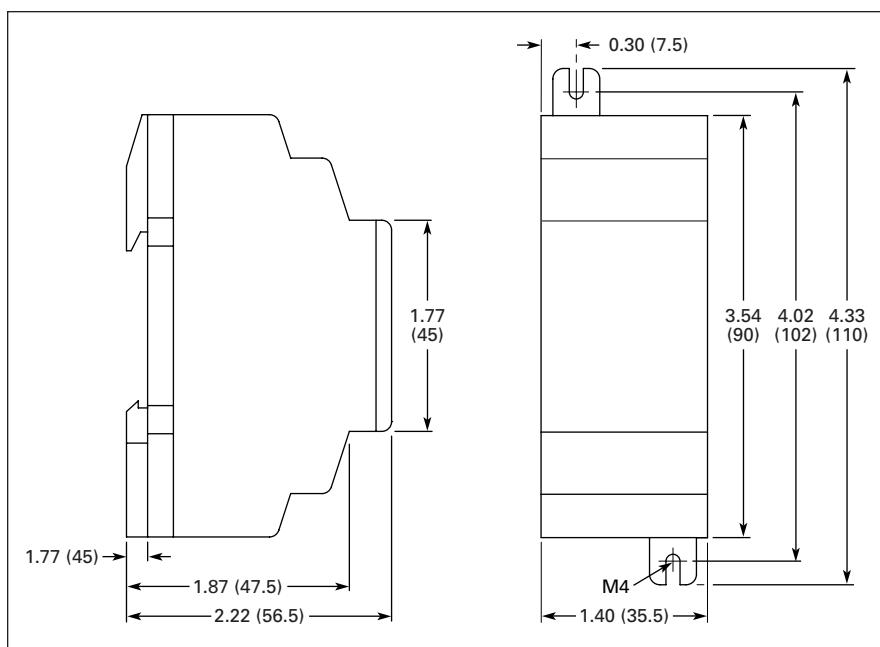


Figure 39. EZ256-HCI Dimensions in Inches (mm)

Wiring Diagram

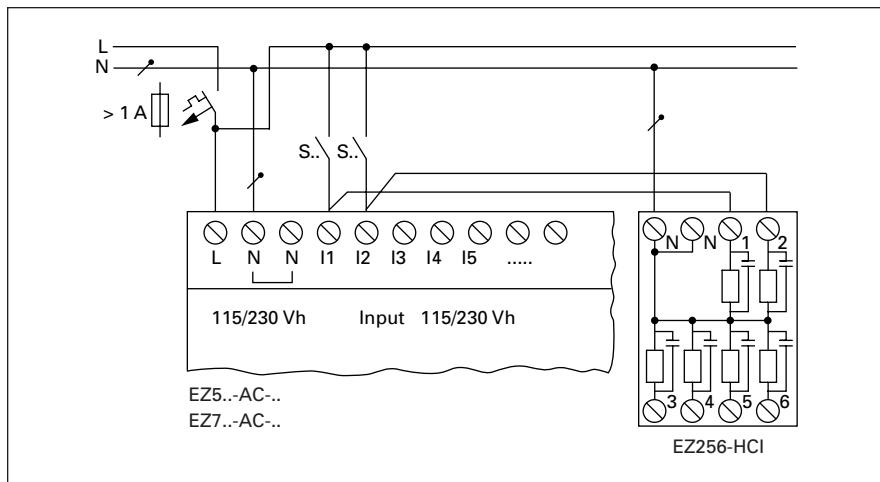
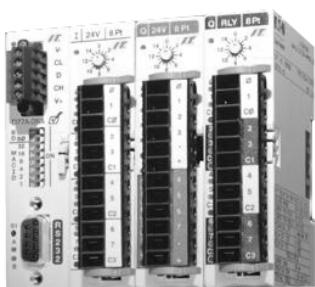


Figure 40. EZ256-HCI Wiring Diagram



IT. I/O Products D77A-DQ8, D77A-DI8 and D77A-AQ8 with DeviceNet Adapter, D77D-DNA

Product Description

Cutler-Hammer® Intelligent Technologies (*IT.*) D77A I/O Modules, which are built by Eaton's electrical business for industrial applications, are available in 8 and 16 point I/O, combination I/O and analog I/O. These modules are capable of connecting to AC or DC voltages and also to voltage or current analog I/O. Input modules have two points per isolated common while the outputs are available in relay and solid-state with two points per isolated common for most output modules. When added flexibility is needed, modules that combine inputs and outputs, AC, DC and relay are available.

Application Description

Typical D77A I/O Module applications use the D77A I/O as stand-alone remote I/O and in a system where motor control and I/O are required within a single customer panel.

I/O and the motor control can be connected to a single network adapter. The network adapter then represents the D77A I/O and motor control as remote I/O, consuming only one network address. The network then controls and monitors the connected devices. Connecting devices is done by DIN rail back plane or by Plug-and-Play cables.

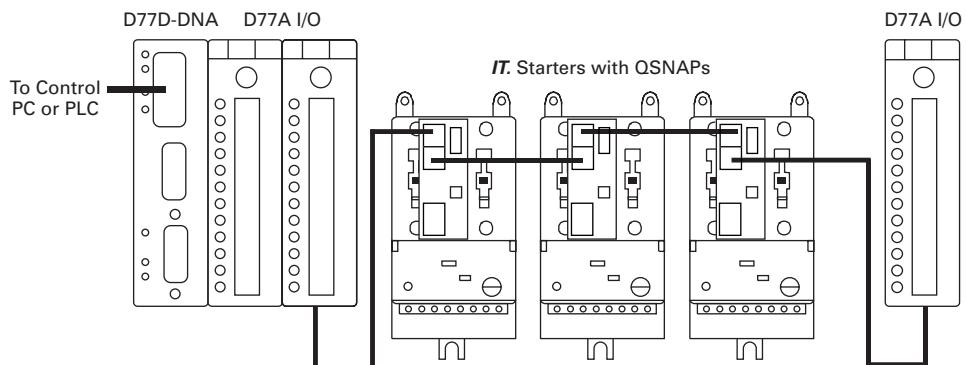


Figure 41. Application — Distributed I/O and Motor Control

Remote I/O Modules (D77A Series)

Features, Functions and Benefits**Scalable Solutions**

Since each application is different, the I/O offering has been designed to allow for maximum flexibility to tailor the I/O needs of our customer. The I/O product offering includes not only 8 and 16 point modules but also combination I/O modules. Signal types include 24V DC I/O, 120V AC I/O, solid-state outputs, relay outputs, analog inputs and analog outputs.

All Modules

LED Status – When the LED is illuminated, the proper ON state signal is received at the input or the output point.

Removable Lockable Terminals – To facilitate easy removal of the I/O module, the terminal block has been designed to be easily removed with the field wiring installed. A unique locking mechanism provides for easy removal of the terminal block and also positive locking of the terminal to the I/O module.

Terminal Identification – Each terminal is marked for ease of wiring and troubleshooting.

Isolation – Each I/O module is optically isolated between the field I/O and the network adapter.

Securing Tabs – Each I/O module has a locking mechanism so that it can be positively secured to a DIN rail.

Barrier Type Terminals – Each terminal has a barrier to minimize shorting of field wiring.

Removal/Insertion – Each I/O module supports removal and insertion under power.

Interconnection System – Each I/O module supports both a backplane style interconnect and a cable interconnect system for system communication.

Points per Common – Each I/O module supports two I/O points per isolated common except for the DC output module which is four points per isolated common.

Input Modules

Input Filter – Each input module supports a user definable input debounce. The time can be set from 1 mS to 250 mS.

Output Modules

Output Safe State – Each output module supports a user definable safe state for loss of communication. The states are hold last state, ON or OFF (default).

Configurable Power ON State – When the output module initially powers up and prior to system communication starting, the outputs can be preconfigured to go to a predefined state which can be ON or OFF (default).

Operation

When the D77A I/O Modules are properly installed and each has a properly configured Group ID, no configuration is needed for standard operation.

Discrete Input Modules

When a signal is present at the input point, the module responds using the following procedures:

- Optical Isolation** – Optical isolation protects the I/O circuits and communication circuits from possible damage due to transients and overvoltage.
- Debounce Logic/Control** – Debounce limits the effects of transients and electrical noise by requiring the input to be true for a certain period of time before the logic acknowledges a true signal. Once a true signal is achieved, the logic turns on the LED.

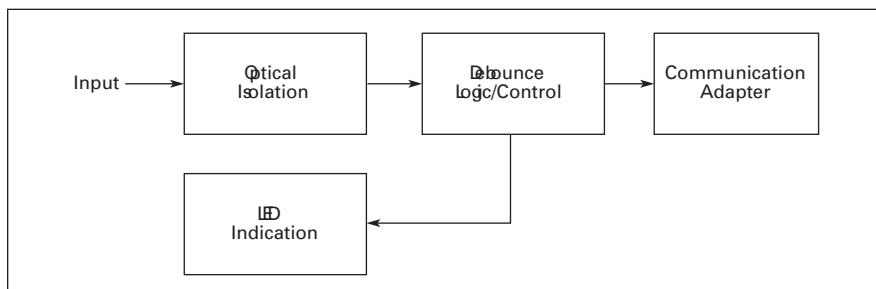


Figure 42. Input Module Operation

Discrete Output Modules

When an output is commanded to change state, the module responds using the following procedures:

- Optical Isolation** – Optical isolation protects the I/O circuits and communication circuits from possible damage due to transients and overvoltage. Once an active signal is sent to the optical isolation, the LED is activated.
- Output Drivers** – The driver turns on the output point.

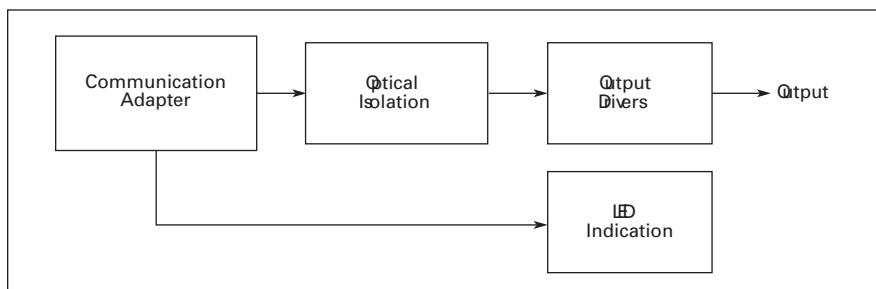


Figure 43. Output Module Operation

Analog Input Module

The analog input module is single-ended uni-polar input type capable of measuring either voltage or current inputs. Each of the channels can be individually configured to be either one of the current scales or one of the voltage scales.

Analog Output Module

The analog output module is single-ended uni-polar output type capable of sourcing either voltage or current outputs. The analog output module requires a 24V DC source that will provide the current or voltage source for the outputs, each of the channels can be individually configured to be either one of the current scales or one of the voltage scales.

Standards and Certifications**Approvals****Table 44. Approvals/Certifications**

Description	Specification
Electrical/EMC	
ESD Immunity (IEC 61000-4-2)	± 8 kV air, ± 4 kV contact
Radiated Immunity (IEC 61000-4-3)	10V/m 80 – 1,000 MHz, 80% amplitude modulation @ 1 kHz
Fast Transient (IEC 61000-4-4)	± 2 kV supply and control, ± 1 kV communications
Surge (IEC 61000-4-5)	± 1 kV line-to-ground, ± 2 kV line-to-line
RF Conducted (IEC 61000-4-6)	10V, .15 – 80 MHz
Magnetic Field (IEC 61000-4-8)	30A/m, 50 Hz
Voltage Dips (IEC 61000-4-11)	30% dip @ 10 mS, 60% dip @ 100 mS, >95% interrupt @ 5 mS
Other Approvals	
Ingress Protection Code	IP20
Radiated and Conducted Emissions	EN 5011 Class A
Agency Certifications	UL 508, CUL (CSA C22.2 No. 14), CE (Low Voltage Directive)

Technical Data and Specifications**Table 45. Environmental Ratings**

Description	Specification
Transportation & Storage	
Temperature	-58° – 176°F (-50° – 80°C)
Humidity	5 – 95% non-condensing
Operating	
Temperature	-13° – 131°F (-25° – 55°C) Discrete I/O -32° – 131°F (0° – 55°C) Analog I/O
Humidity	5 – 95% non-condensing
Altitude	Above 6,600 ft. (2000m) consult factory
Shock IEC 68-2-27	8G any direction for 11 mS
Vibration IEC 68-2-6	10 – 55 Hz, 3G, .7 mm maximum peak-to-peak
Pollution Degree	2
Enclosure	IP20

AC Input Modules — D77A-AI8, D77A-AI16

Table 46. Specifications

Description	Specification
Nominal Input Voltage	120V AC
Operating Voltage	80 – 140V AC
Number of Inputs	8 (D77A-AI8) 16 (D77A-AI16)
Points per Common	2
OFF-State Voltage	< 30V AC
ON-State Voltage	> 80V AC
Nominal Input Current	15 mA
Signal Delay	1/2 Cycle
Isolation	1,500V
Module Current Draw	33 mA (D77A-AI8), 46 mA (D77A-AI16)
Terminal Screw Torque	7 – 9 in-lb

Table 47. Operating Voltage Range — AC Input Modules

OFF State	Transition Region	ON State			
0	30V AC	30V AC	80V AC	80V AC	140V AC

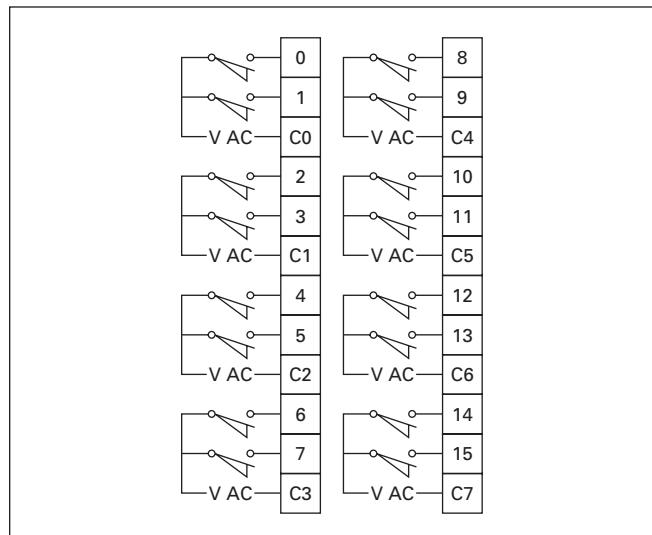


Figure 44. Wiring Diagram — AC Input Modules, D77A-AI8 & D77A-AI16

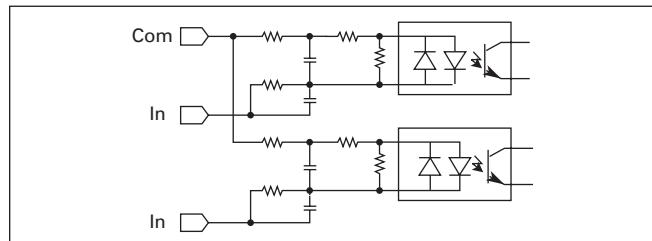


Figure 45. Circuit Diagram — AC Input Modules, D77A-AI8 & D77A-AI16

AC Output Modules — D77A-AQ8, D77A-AQ16

Table 48. Specifications

Description	Specification
Nominal Input Voltage	120V AC
Operating Voltage	80 – 140V AC
Number of Outputs	8 (D77A-AQ8) 16 (D77A-AQ16)
Points per Common	2
Minimum Load Current (Resistive)	15 mA
Maximum Current/Point (Resistive)	.5A @ 30°C .1A @ 55°C
Current per Module	4A (D77A-AQ8) @ 30°C 8A (D77A-AQ16) @ 30°C
Surge Current (10 ms)	10A
OFF-State Leakage	2 mA
Signal Delay	1/2 Cycle
Module Current Draw	120 mA (D77A-AQ8) 220 mA (D77A-AQ16)
Terminal Screw Torque	7 – 9 in-lb

Table 49. Operating Voltage Range — AC Output Modules

Transition Region	ON State
0	80V AC

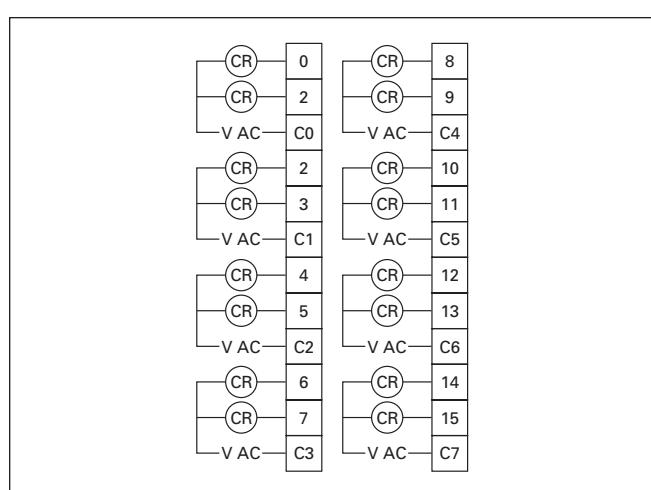


Figure 46. Wiring Diagram — AC Output Modules, D77A-AQ8 & D77A-AQ16

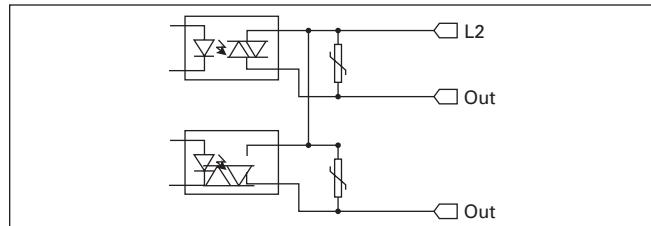


Figure 47. Circuit Diagram — AC Output Modules, D77A-AQ8 & D77A-AQ16

Remote I/O Modules (D77A Series)

DC Input Modules — D77A-DI8, D77A-DI16

Table 50. Specifications

Description	Specification
Nominal Input Voltage	24V DC
Operating Voltage	18 – 30V DC
Number of Inputs	8 (D77A-DI8) 16 (D77A-DI16)
Points per Common	2
Signal Delay	5 mS (Programmable to 250 mS)
OFF-State Voltage	< 6V DC
ON-State Voltage	> 18V DC
Nominal Input Current	5 mA
Isolation	1500V
Module Current Draw	35 mA (D77A-DI8) 49 mA (D77A-DI16)
Terminal Screw Torque	7 – 9 in-lb

Table 51. Operating Voltage Range — DC Input Modules

OFF State	Transition Region	ON State
0	6V DC	6V DC

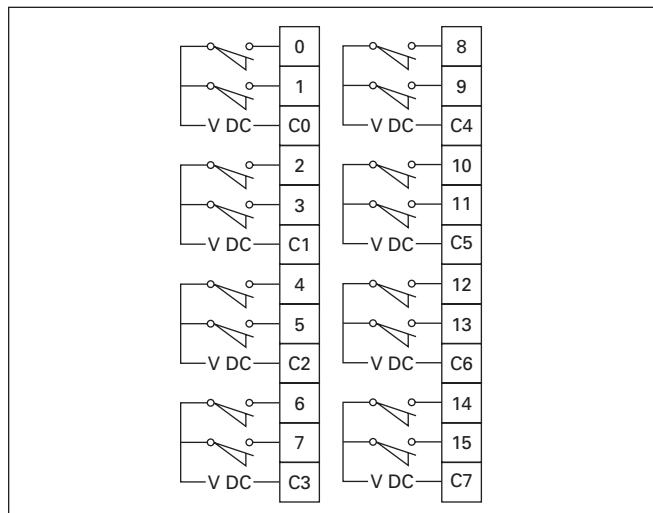


Figure 48. Wiring Diagram — DC Input Modules, D77A-DI8 & D77A-DI16

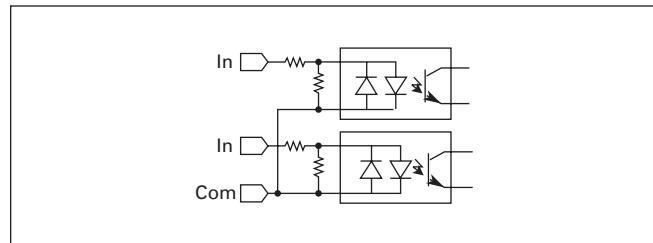


Figure 49. Circuit Diagram — DC Input Modules, D77A-DI8 & D77A-DI16

DC Output Modules Sink — D77A-DQ8, D77A-DQ16

Table 52. Specifications

Description	Specification
Nominal Input Voltage	24V DC
Type	MQSFET sink
Operating Voltage	18 – 30V DC
Number of Outputs	8 (D77A-DQ8) 16 (D77A-DQ16)
Points per Common	4
Signal Delay	1 mS
Maximum Current/Point	.75A
Current per Module	6A (D77D-DQ8) 12A (D77D-DQ16)
Surge Current (10 mS)	4A
OFF-State Leakage	1 mA
Module Current Draw	85 mA (D77A-DQ8) 126 mA (D77A-DQ16)
Terminal Screw Torque	7 – 9 in-lb

Table 53. Operating Voltage Range — DC Output

Transition Region	ON State
0	18V DC

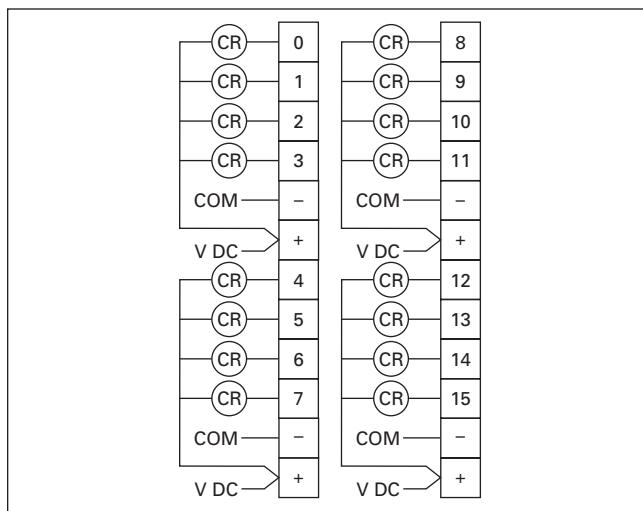


Figure 50. Wiring Diagram — DC Output Modules Sink, D77A-DQ8 & D77A-DQ16

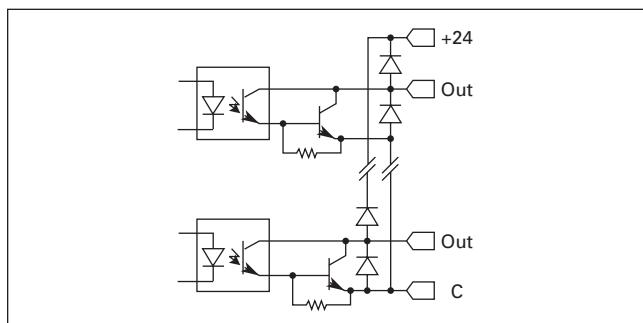


Figure 51. Circuit Diagram — DC Output Modules Sink, D77A-DQ8 & D77A-DQ16

DC Output Modules Source — D77A-DQ8C, D77A-DQ16C

Table 54. DC Output Modules Specifications

Description	Specification
Nominal Voltage	24V DC
Type	MOSFET Source
Operating Voltage	18 – 30V DC
Number of Outputs	8 (D77A-DQ8C) 16 (D77A-DQ16C)
Points per Common	4
Signal Delay	1 mS
Max. Current per Point ①	.75A
Max. Current per Module ①	6A (D77A-DQ8C) 12A (D77A-DQ16C)
Surge Current (10 mS)	4A
OFF-State Leakage	.5 mA
Module Current Draw	29 mA (D77A-DQ8C) 45 mA (D77A-DQ16C)

① Resistive current at 55°C ambient.

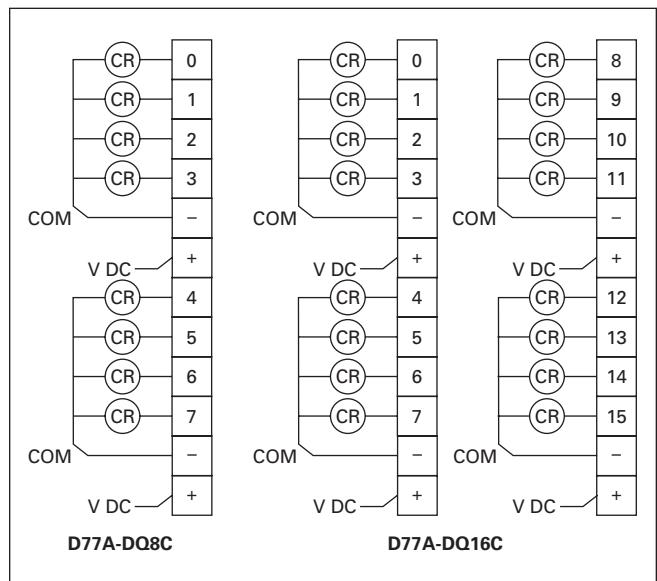


Figure 52. Wiring Diagram — DC Output Modules Source, D77A-DQ8C & D77A-DQ16C

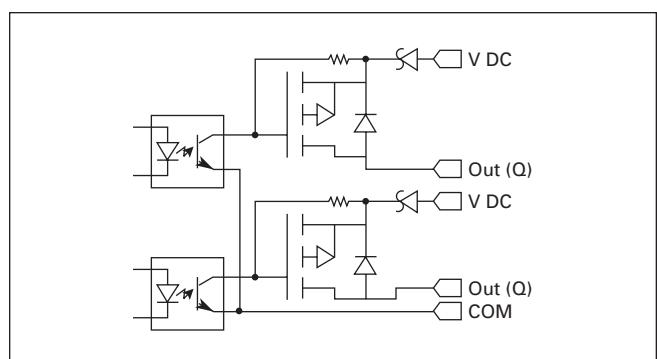


Figure 53. Circuit Diagram — DC Output Modules Source, D77A-DQ8C & D77A-DQ16C

Relay Output Modules — D77A-RQ8, D77A-RQ16

Table 55. Relay Output Modules Specifications

Description	Specification
Nominal Voltage	120V AC 24V DC
Number of Outputs	8 (D77A-RQ8) 16 (D77A-RQ16)
Points per Common	2
Relay OFF Time	6 mS
Relay ON Time	3 mS
Max. Current per Point ②	3A
Max. Current per Module ②	24A (D77A-RQ8) 48A (D77A-RQ16)
Electrical Life	100,000 Cycles
Mechanical Life	1,000,000 Cycles
Module Current Draw	92 mA (D77A-RQ8) 164 mA (D77A-RQ16)

② Resistive current at 55°C ambient.

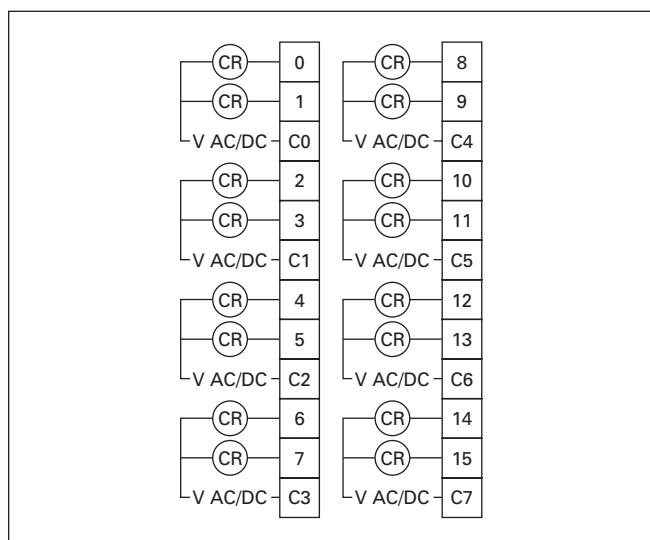


Figure 54. Wiring Diagram — Relay Output Modules, D77A-RQ8 & D77A-RQ16

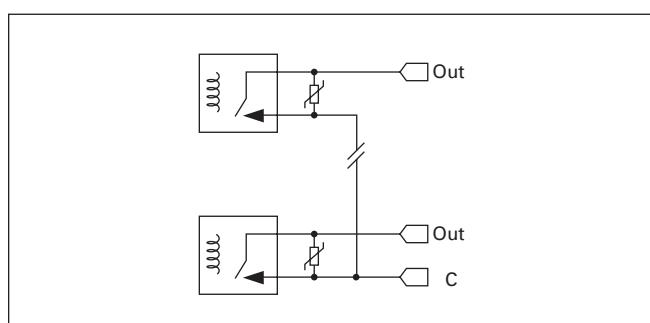


Figure 55. Circuit Diagram — Relay Output Modules, D77A-RQ8 & D77A-RQ16

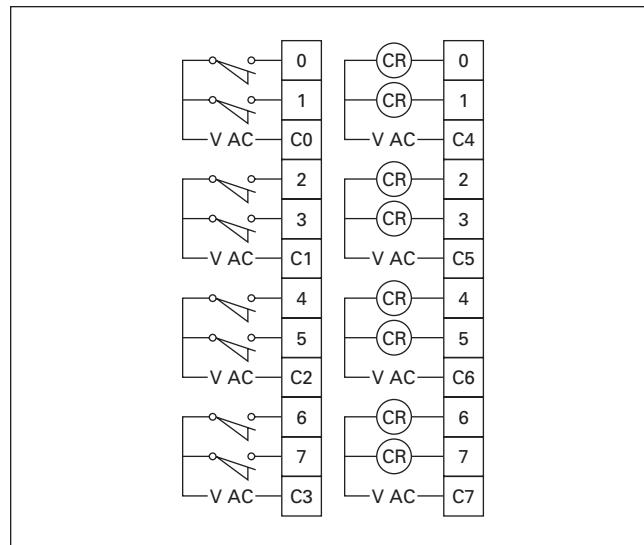
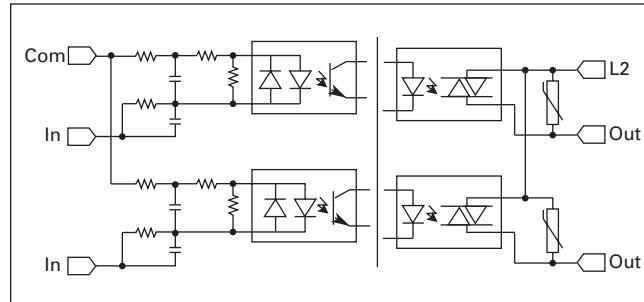
AC Input AC Output Module — D77A-AI8AQ8**Table 56. Specifications**

Description	Specification	
	AC Input	AC Output
Nominal Voltage	120V AC	
Operating Voltage	80 – 140V AC	
Number of Points	8	
Points per Common	2	
Signal Delay	1/2 Cycle (programmable to 250 mS)	—
OFF-State Voltage	< 30V AC	—
ON-State Voltage	> 80V AC	—
Nominal Current	15 mA	—
Signal Delay	—	1/2 Cycle
Max. Current per Point ①	—	.5A @ 30°C .1A @ 55°C
Max. Current per Module ①	—	4A @ 30°C .8A @ 55°C
Surge Current (10 mS)	—	10A
OFF-State Leakage	—	2 mA
Isolation	—	1,500V
Module Current Draw	—	104 mA

① Resistive current at 55°C.

Table 57. Operating Voltage Range

	OFF State		Transition Region		ON State	
Input	0	30V AC			80V AC	140V AC
Output			0V AC	80V AC	80V AC	140V AC

**Figure 56. Wiring Diagram — AC Input AC Output****Figure 57. Circuit Diagram — AC Input AC Output**

DC Input DC Output Module — D77A-DI8DQ8**Table 58. Specifications**

Description	Specification	
	DC Input	DC Sink Output
Nominal Voltage	24V DC	
Operating Voltage	18 – 30V AC	
Number of Points	8	
Points per Common	2	4
Signal Delay	5 mS (programmable to 250 mS)	—
OFF-State Voltage	< 6V DC	—
ON-State Voltage	> 18V DC	—
Nominal Current	5 mA	—
Signal Delay	—	1 mS
Max. Current per Point ①	—	.75A
Max. Current per Module ①	—	6A
Surge Current (10 mS)	—	4A
OFF-State Leakage	—	1 mA
Isolation	1,500V	
Module Current Draw	99 mA	

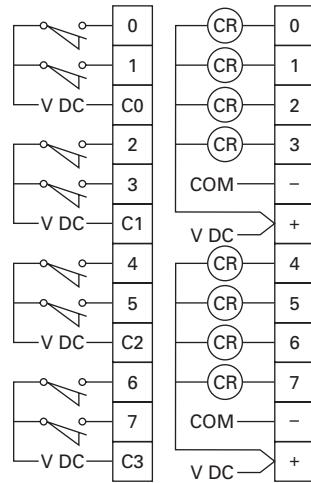
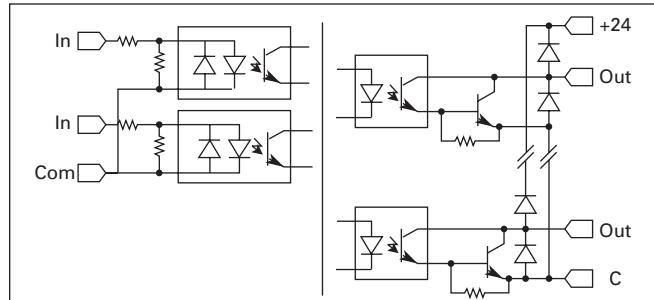
① Resistive current at 55°C.

Table 59. Operating Voltage Range — Input

OFF State	Transition Region		ON State
0	8V DC	8V DC	18V DC

Table 60. Operating Voltage Range — Output

Transition Region		ON State
0	18V DC	18V DC

**Figure 58. Wiring Diagram — DC Input DC Output****Figure 59. Circuit Diagram — DC Input DC Output**

Remote I/O Modules (D77A Series)

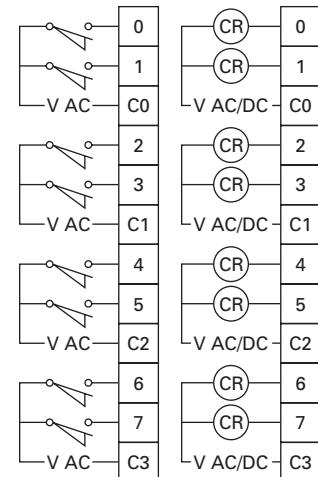
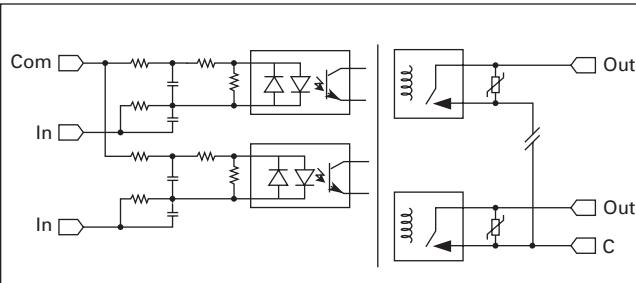
AC Input Relay Output Module — D77A-AI8RQ8**Table 61. Specifications**

Description	Specification	
	AC Input	Relay Output
Nominal Voltage	120V AC	120V AC 24V DC
Operating Voltage	80 – 140V AC	0 – 30V DC 0 – 140V AC
Number of Points		8
Points per Common		2
Signal Delay	1/2 Cycle (programmable to 250 mS)	—
OFF-State Voltage	< 30V AC	—
ON-State Voltage	> 80V AC	—
Nominal Current	15 mA	—
Relay OFF Time	—	6 mS
Relay ON Time	—	3 mS
Max. Current per Point ①	—	3A
Max. Current per Module ①	—	24A
Electrical Life	—	100,000 Cycles
Mechanical Life	—	1,000,000 Cycles
Isolation		1,500V
Module Current Draw		104 mA

① Resistive current at 55°C.

Table 62. Operating Voltage Range — Input

OFF State	Transition Region	ON State
0	30V AC	30V AC

**Figure 60. Wiring Diagram — AC Input Relay Output****Figure 61. Circuit Diagram — AC Input Relay Output**

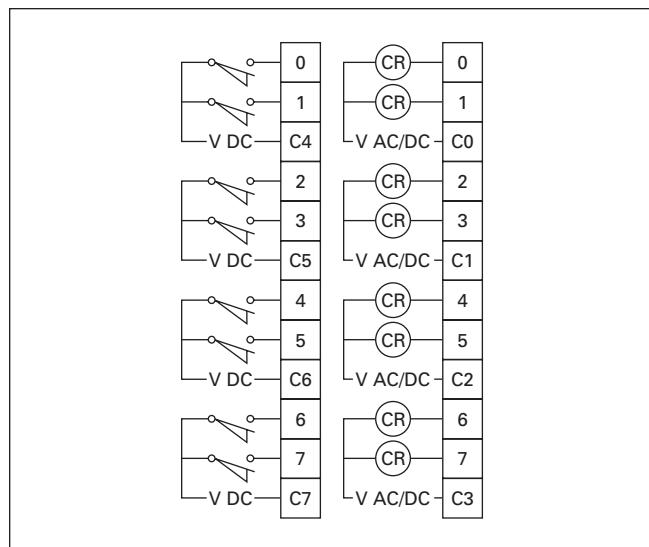
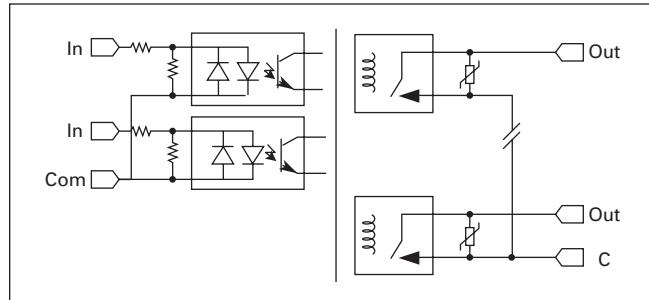
DC Input Relay Output Module — D77A-DI8RQ8**Table 63. Specifications**

Description	Specification	
	DC Input	Relay Output
Nominal Voltage	24V DC	120V AC 24V DC
Operating Voltage	18 – 30V DC	0 – 30V DC 0 – 140V AC
Number of Points		8
Points per Common		2
Signal Delay	5 mS (programmable to 250 mS)	—
OFF-State Voltage	< 6V DC	—
ON-State Voltage	> 18V DC	—
Nominal Current	5 mA	—
Relay OFF Time	—	6 mS
Relay ON Time	—	3 mS
Max. Current per Point ①	—	3A
Max. Current per Module ①	—	24A
Electrical Life	—	100,000 Cycles
Mechanical Life	—	1,000,000 Cycles
Isolation		1,500V
Module Current Draw		106 mA

① Resistive current at 55°C.

Table 64. Operating Voltage Range — Input

OFF State	Transition Region	ON State
0	8V DC	8V DC

For more information visit: www.eaton.com**Figure 62. Wiring Diagram — DC Input Relay Output****Figure 63. Circuit Diagram — DC Input Relay Output**

Remote I/O Modules (D77A Series)

Analog Input Module — D77A-NI4

Table 65. D77A-NI4 — Specifications

Description	Specification	
Voltage Input	0 – 5V DC, 1 – 5V DC, 0 – 10V DC	
Current Input	4 – 20 mA, 0 – 20 mA	
Module Current Draw	60 mA max.	
Input Types	Single ended, Uni-polar	
Points	4	
Resolution ①	Filter Setting	Effective Resolution
		0 – 10V DC
	50 Hz	14 bit
	60 Hz	14 bit
	250 Hz	13 bit
	500 Hz	13 bit
Input Full Scale	Voltage	Current
	0 – 10.5V DC, 0 – 5.25V DC	0 – 21 mA
Max Overload	30V DC / 32 mA	
Input to Bus Isolation	500V AC for 60 seconds	
Input Filter	50 Hz, 60 Hz, 250 Hz, 500 Hz	
Common Mode Rejection	> 60 dB @ 50 Hz and 60 Hz	
Normal Mode Rejection Ratio	- 50 dB @ 50 Hz and 60 Hz	
Input Impedance	Voltage	Current
	15 M ohm	250 ohm
Accuracy	Voltage	Current
	± 0.3% full scale @ 25°C ± 0.4% full scale @ 0 – 55°C	± 0.45% full scale @ 25°C ± 0.5% full scale @ 0 – 55°C
Update Rate ②	Input Filter	Update Time
		336 mS
	50 Hz	283 mS
	60 Hz	80 mS
	250 Hz	44 mS
	500 Hz	

① Input filter setting affects the effective resolution of channel.

② The time to update one channel when various filters are used within one module.

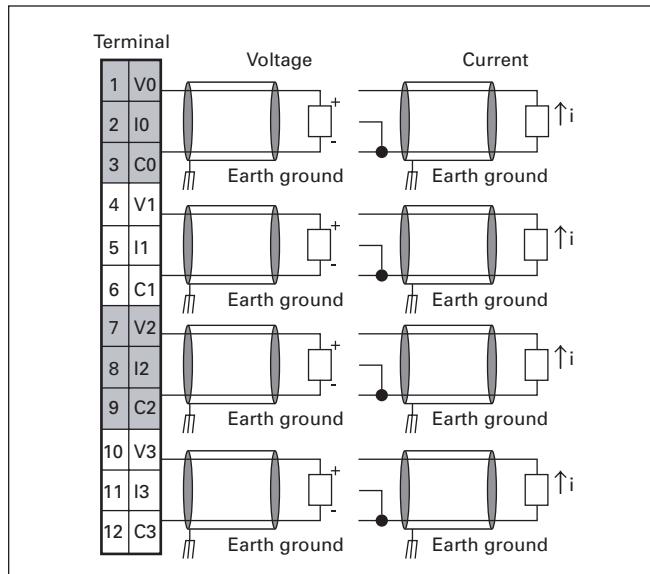


Figure 64. D77A-NI4 Wiring Diagram

Analog Output Module — D77A-NQ2

Table 66. D77A-NQ2 — Specifications

Description	Specification	
Voltage Output	0 – 5V DC, 1 – 5V DC, 0 – 10V DC	
Current Output	4 – 20 mA, 0 – 20 mA	
Module Current Draw	40 mA max.	
External Power	60A max. @ 24V DC	
Output Types	Single ended, Uni-polar	
Protection	Open and Short Circuit	
Points	2	
Resolution	Range	Resolution
	4 – 20 mA, 0 – 20 mA	14 bit
	0 – 10V DC	14 bit
	0 – 5V DC, 1 – 5V DC	13 bit
Output Full Scale	Voltage	Current
	0 – 10.5V DC, 0 – 5.25V DC	0 – 21 mA
Overvoltage Protection	36V DC @ \pm terminals	
Output to Bus Isolation	1500V AC for 60 seconds	
Resistive Load on Current Output	< 500 ohm	
Load Range on Voltage Output	> 1 K ohm	
Max. Inductive Load	0.1 mH	
Max. Capacitive Load	1 μ F	
Output ripple (0 – 50 Hz)	\pm 0.1%	
Output Impedance	10 ohm	
Accuracy	Voltage	Current
	0.8% full scale @ 25°C	0.8% full scale @ 25°C
	1% full scale @ 0 – 55°C	1% full scale @ 0 – 55°C
Update Rate	350 μ S	

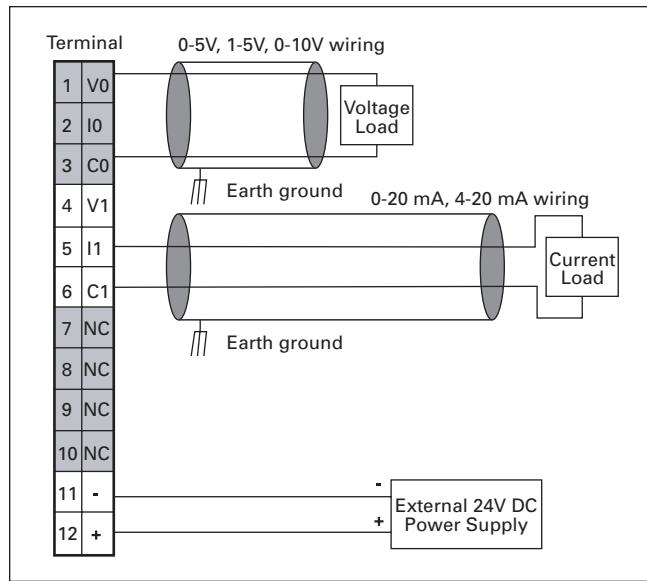


Figure 65. D77A-NQ2 Wiring Diagram

Remote I/O Modules (D77A Series) — Accessories

Dimensions

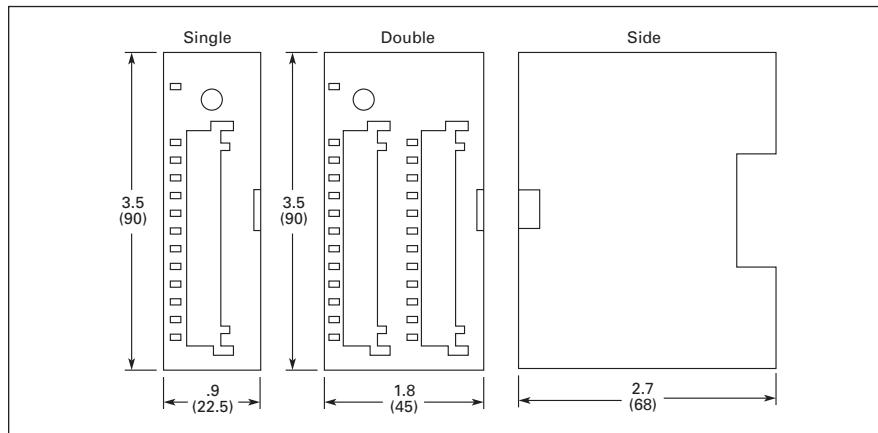


Figure 66. I/O Module — Approximate Dimensions in Inches (mm)

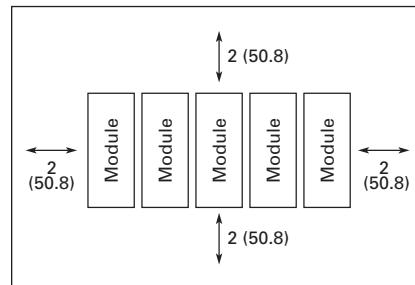


Figure 67. I/O Module Ventilation — Approximate Dimensions in Inches (mm)

Product Selection

Table 67. D77A- I/O Module Product Selection

Description	Max. Output Current per Point	Points per Common	Size	Catalog Number	Price U.S. \$
8 Point 24V DC Input	N/A	2	Single	D77A-DI8	171.00
16 Point 24V DC Input	N/A	2	Double	D77A-DI16	227.00
8 Point 24V DC Solid-State Output	.75 Amp	4	Single	D77A-DQ8	239.00
16 Point 24V DC Solid-State Output	.75 Amp	4	Double	D77A-DQ16	299.00
8 Point 120V AC Input	N/A	2	Single	D77A-AI8	200.00
16 Point 120V AC Input	N/A	2	Double	D77A-AI16	268.00
8 Point 120V AC Solid-State Output	.5 Amp	2	Single	D77A-AQ8	258.00
16 Point 120V AC Solid-State Output	.5 Amp	2	Double	D77A-AQ16	411.00
8 Point Relay Output (24V DC/120V AC)	3 Amp	2	Single	D77A-RQ8	201.00
16 Point Relay Output (24V DC/120V AC)	3 Amp	2	Double	D77A-RQ16	381.00
8 Point 24V DC Input / 8 Point 24V DC Output	.75 Amp	2 (in), 4 (out)	Double	D77A-DI8DQ8	306.00
8 Point 24V DC Input / 8 Point Relay Output	3 Amp	2 (in), 2 (out)	Double	D77A-DI8RQ8	314.00
8 Point 120V AC Input / 8 Point 120V AC Output	.5 Amp	2 (in), 2 (out)	Double	D77A-AI8AQ8	392.00
8 Point Relay Output / 8 Point 120V AC Input	3 Amp	2 (in), 2 (out)	Double	D77A-AI8RQ8	345.00
4 Point Analog Input	N/A	4	Single	D77A-NI4	431.00
2 Point Analog Output	N/A	2	Single	D77A-NQ2	431.00

Accessories

Table 68. I/O Module Product Accessories

Description	Catalog Number	Price U.S. \$
7-Position Backplane with DIN Rail	D77E-BP7	66.00
12-Position Backplane with DIN Rail	D77E-BP12	90.00
25 cm Interconnect Plug-and-Play Cable	D77E-QPIP25	33.25
1 Meter Interconnect Plug-and-Play Cable	D77E-QPIP100	38.75
2 Meter Interconnect Plug-and-Play Cable	D77E-QPIP200	44.25
3 Meter Interconnect Plug-and-Play Cable	D77E-QPIP300	49.75
I/O Terminator DIN Style and Power Tap	D77E-QPLR	99.50
I/O Terminator RJ11 Style	D77E-TERRJ	38.75

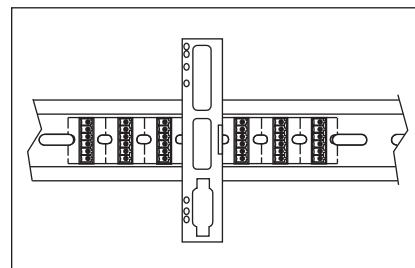


Figure 68. Backplane with DIN Rail

Discount Symbol 1CD1

Starter Network Adapters (SNAP) (D77B Series) — DeviceNet SNAP

DeviceNet Starter Network Adapter Product (DSNAP)



Catalog Number D77B-DSNAP-X3 with 54 mm IT. Starter

Product Description

The Cutler-Hammer® DeviceNet Starter Network Adapter Product (DSNAP) from Eaton's electrical business is a front-mount device that serves as a single node on DeviceNet, providing communication capability, control and monitoring to Intelligent Technologies (IT.) Electromechanical Starters, as well as the S751 and S752 Soft Start, as listed in **Tables 69 – 71**.

The **IT.** DSNAP has an optional HANDS OFF/AUTO (HOA) module that enables the starter to be operated in hand mode; even if the DSNAP is not powered. The HOA option is used for customers who need the extra security of manual control in conjunction with the communication capabilities of DeviceNet.

With the addition of a D64 zero sequence CT, the DSNAP can be enabled to detect ground faults for added protection.

Features

- Communication to DeviceNet consuming one DeviceNet MAC ID
- Manually set MAC ID and baud rate; configuration using a software application is not required for normal operation
- Advanced configuration using CH Studio
- Includes pre-wired starter interconnect cable and terminal adapter

Comprehensive Motor Data and Control

- RMS average current
- % of operating FLA
- % thermal memory
- Integral contact position detection
- Operating status and fault codes
- At speed (soft starters)
- START/STOP control
- RUN/FORWARD-REVERSE control
- Trip Reset

Extended Starter Capabilities

- Ground fault detection (with accessory)
- Fault log
- Overcurrent warning (adjustable)
- Underrun warning (adjustable)

Table 69. IEC SNAP Connectivity

IEC E101, E501		
Frame	Size	Continuous Ampacity Rating
45 mm	B	18 Amp
		25 Amp
		32 Amp
		40 Amp
54 mm	C	50 Amp
		65 Amp
76 mm	D	85 Amp
		100 Amp
		125 Amp
105 mm	E	160 Amp
		200 Amp
		250 Amp
140 mm	F	315 Amp
		420 Amp

Table 70. NEMA SNAP Connectivity

NEMA N101, N501	
Size	Continuous Ampacity Rating
00	9
0	18
1	27
2	45
3	90
4	135
5	270

Table 71. S751/S752 SNAP Connectivity

S751/S752 Soft Start	
54 mm	All Sizes

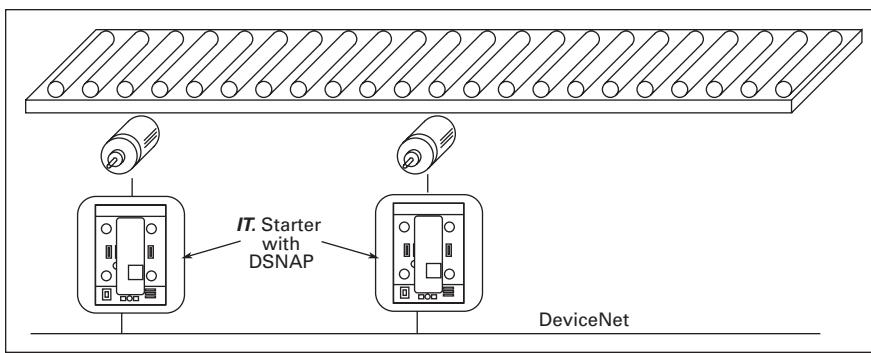


Figure 69. Typical DSNAP Application

Application Description

In a typical application, the DSNAP front mounts to an **IT.** starter or soft start. The DSNAP connects directly to DeviceNet, allowing for control and monitoring of the starter/soft start. A PC or PLC serves as the central control and scans the DSNAP for motor control and monitoring information. The HOA module provides for the ability to locate operators on the panel for manual operation.

Standards and Certifications

Approvals

Table 72. Approvals/Certifications

Description	Specification
Electrical/EMC	
ESD Immunity (IEC 61000-4-2)	± 8 kV air, ± 4 kV contact
Radiated Immunity (IEC 61000-4-3)	10V/m 80 – 1,000 MHz, 80% amplitude modulation @ 1 kHz
Fast Transient (IEC 61000-4-4)	± 2 kV supply and control, ± 1 kV communications
Surge (IEC 61000-4-5)	± 1 kV line-to-ground, ± 2 kV line-to-line
RF Conducted (IEC 61000-4-6)	10V, .15 – 80 MHz
Magnetic Field (IEC 61000-4-8)	30A/m, 50 Hz
Voltage Dips (IEC 61000-4-11)	30% dip @ 10 mS, 60% dip @ 100 mS, >95% interrupt @ 5 mS

Other Approvals

Ingress Protection Code (IEC 60947-1)	IP20
Radiated and Conducted Emissions	EN 5011 Class A
Agency Certifications	UL 508, CUL (CSA C22.2 No. 14), CE (Low Voltage Directive), ODVA Conformance Tested

Technical Data and Specifications

Table 73. DeviceNet Specifications

DeviceNet Connections	Group 2 Slave Polling Explicit No UCMM
DeviceNet Baud Rate	125K, 250K, 500K

Table 74. Environmental Ratings

Description	Specifications
Transportation/Storage	
Temperature	-58° to 176°F (-50° to 80°C)
Humidity	5 – 95% non-condensing
Operating	
Temperature	-4° to 131°F (-20° to 55°C)
Humidity	5 – 95% non-condensing
Altitude	Above 2000 meters (6600 feet) consult factory
Pollution Degree	2
Power Draw	90 mA Steady State
Shock (IEC 68-2-27)	15G any direction for 11 mS
Vibration (IEC 68-2-6)	5 – 150 Hz, 5G, .7 mm max. peak-to-peak

Dimensions

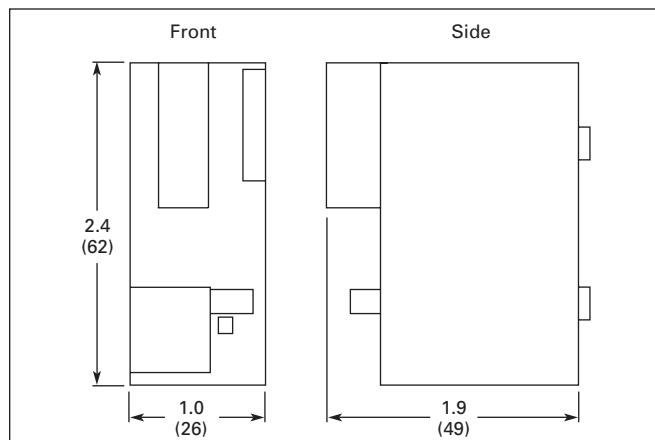


Figure 70. DSNAP Approximate Dimensions in Inches (mm)

Product Selection

Table 75. Product Selection

Description	Catalog Number	Price U.S. \$
DSNAP Kit for FVNR Starters	D77B-DSNAP-X1	335.00
DSNAP Kit for FVR Starters	D77B-DSNAP-X2	371.00
DSNAP Kit for FVNR Starters with HOA	D77B-DSNAP-X3	390.00
DSNAP Kit for FVR Starters with HOA	D77B-DSNAP-X4	458.00
DSNAP Adapter for Size 5 and Size F Frame Starters	D77B-140A	47.25
SNAP Auxiliary Connector	D77B-AC1	42.00

Note: For D64 zero sequence CTs refer to Tab 49 in Publication No. CA08102001E.

Starter Network Adapters (SNAP) (D77B Series) — QCPort SNAP

QCPort Starter Network Adapter Product (QSNAP)



Catalog Number D77B-QSNAP-X1
with 54 mm IT Starter

Product Description

The Cutler-Hammer® QCPort Starter Network Adapter Product (QSNAP) from Eaton's electrical business is a front-mount device providing communication capability, control and monitoring to Intelligent Technologies (IT) Electromechanical Starters, as well as the S751 and S752 Soft Start, as listed in **Tables 76 – 78**. The QSNAP allows connection to any communications adapter and provides access to any support network.

The **IT** QSNAP has an optional HANDS/OFF/AUTO (HOA) module that enables the starter to be operated in hand mode; even if the QSNAP is not powered. The HOA option is used for customers who need the extra security of manual control in conjunction with industrial network communication capabilities.

With the addition of a D64 zero sequence CT, the QSNAP can be enabled to detect ground faults for added protection.

Features

- Starter/contactor connectivity connecting motor control and I/O on same communication adapter
- Configuration using a software application is not required for normal operation
- Advanced configuration using CH Studio
- Includes pre-wired starter interconnect cable and terminal adapter

Comprehensive Motor Data and Control

- RMS average current
- % of operating FLA
- % thermal memory
- Integral contact position detection
- Operating status and fault codes
- At speed (soft starters)
- START/STOP control
- RUN/FORWARD-REVERSE control
- Trip Reset

Extended Starter Capabilities

- Ground fault detection (with accessory)
- Fault log
- Overcurrent warning (adjustable)
- Underrcurrent warning (adjustable)
- Emergency stop detection

Table 76. IEC SNAP Connectivity

IEC E101, E501		
Frame	Size	Continuous Ampacity Rating
45 mm	B	18 Amp
		25 Amp
		32 Amp
54 mm	C	40 Amp
		50 Amp
76 mm	D	65 Amp
		85 Amp
		100 Amp
105 mm	E	125 Amp
		160 Amp
		200 Amp
140 mm	F	250 Amp
		315 Amp
		420 Amp

Table 77. NEMA SNAP Connectivity

NEMA N101, N501	
Size	Continuous Ampacity Rating
00	9
0	18
1	27
2	45
3	90
4	135
5	270

Table 78. S751/S752 SNAP Connectivity

S751/S752 Soft Start	
54 mm	All Sizes

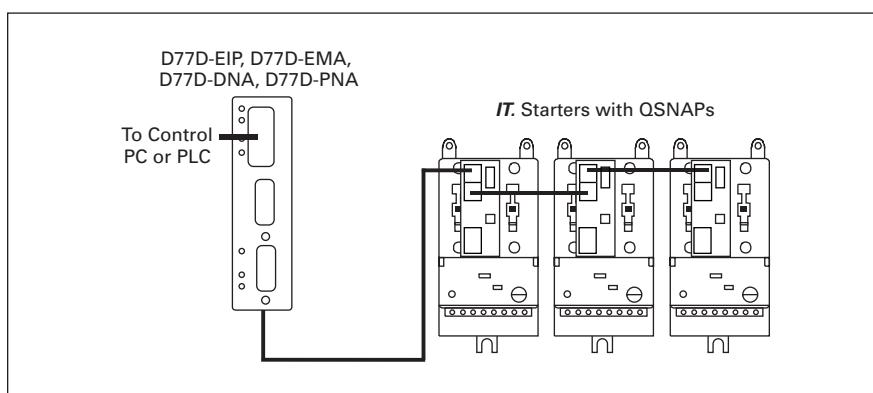


Figure 71. Typical QSNAP Application

Application Description

A typical application for the QSNAP will contain many QSNAPs and many I/O products all connected to a single network adapter. With this architecture, an entire panel can be represented by a single network adapter.

Standards and Certifications

Approvals

Table 79. Approvals/Certifications

Description	Specification
Electrical/EMC	
ESD Immunity (IEC 61000-4-2)	± 8 kV air, ± 4 kV contact
Radiated Immunity (IEC 61000-4-3)	10V/m 80 – 1,000 MHz, 80% amplitude modulation @ 1 kHz
Fast Transient (IEC 61000-4-4)	± 2 kV supply and control, ± 1 kV communications
Surge (IEC 61000-4-5)	± 1 kV line-to-ground, ± 2 kV line-to-line
RF Conducted (IEC 61000-4-6)	10V, .15 – 80 MHz
Magnetic Field (IEC 61000-4-8)	30A/m, 50 Hz
Voltage Dips (IEC 61000-4-11)	30% dip @ 10 mS, 60% dip @ 100 mS, >95% interrupt @ 5 mS

Other Approvals

Ingress Protection Code (IEC 60947-1)	IP20
Radiated and Conducted Emissions	EN 5011 Class A
Agency Certifications	UL 508, CUL (CSA C22.2 No. 14), CE (Low Voltage Directive), ODVA Conformance Tested

Technical Data and Specifications

Table 80. Environmental Ratings

Description	Specifications
Transportation/Storage	
Temperature	-58° to 176°F (-50° to 80°C)
Humidity	5 – 95% non-condensing
Operating	
Temperature	-13° to 149°F (-25° to 65°C)
Humidity	5 – 95% non-condensing
Altitude	Above 2000 meters (6600 feet) consult factory
Power Draw	90 mA Steady State
Shock (IEC 68-2-27)	15G any direction for 11 mS
Vibration (IEC 68-2-6)	5 – 150 Hz, 5G, .7 mm max. peak-to-peak

Dimensions

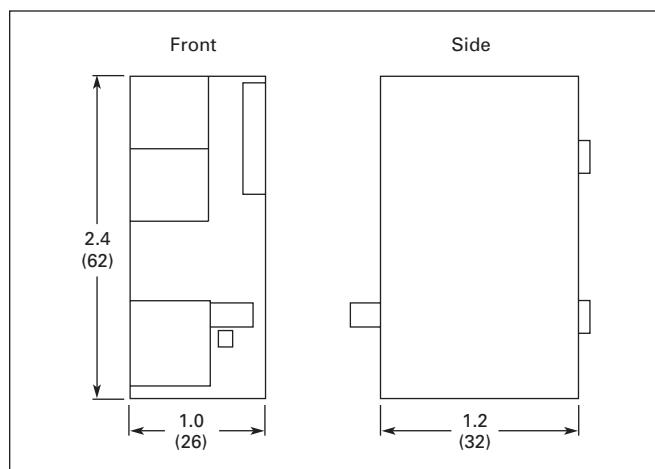


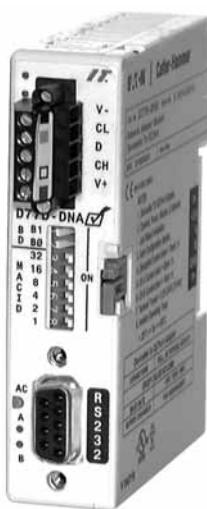
Figure 72. QSNAP Approximate Dimensions in Inches (mm)

Product Selection

Table 81. Product Selection

Description	Catalog Number	Price U.S. \$
QSNAP Kit for FVNR Starters	D77B-QSNAP-X1	301.00
QSNAP Kit for FVR Starters	D77B-QSNAP-X2	333.00
QSNAP Kit for FVNR Starters with HOA	D77B-QSNAP-X3	350.00
QSNAP Kit for FVR Starters with HOA	D77B-QSNAP-X4	350.00
QSNAP Adapter for Size 5 and Size F Frame Starters	D77B-140A	47.25
SNAP Auxiliary Connector	D77B-AC1	42.00

Note: For D64 zero sequence CTs, refer to Tab 49 in Publication No. CA08102001E.



Cat. No. D77D-DNA

Product Description

The Cutler-Hammer® Intelligent Technologies (**IT.**) DeviceNet Adapter (D77D-DNA) from Eaton's electrical business has greatly increased the functionality of **IT.** communicating products, allowing monitoring and control for **IT.** I/O and **IT.** motor control devices. The adapter concentrates all data from these devices into a single DeviceNet node.

To simplify the configuration of the D77D-DNA, a simple auto-configure button press sets the system up for default operation. This automatically configures the DeviceNet I/O assemblies to the system devices. The data from these devices is assembled into a single input and output message.

Application Description

In a typical DeviceNet Adapter application, the D77D-DNA connects directly to DeviceNet, and resides in a system with **IT.** I/O and other communicating motor controls. The data from these **IT.** devices is assembled into a single input and output message before being presented to DeviceNet.

Features, Functions and Benefits

- Communication to DeviceNet consuming one DeviceNet MAC ID
- Provides for control of all **IT.** communicating devices connected to the gateway
- Manually set to MAC ID and baud rate; configuration using a software application is not required for normal operation
- Single button press auto configures the gateway, setting up the system for default operation
- Advanced configuration using CH Studio
- Provides for backplane and inter-connect cable connections to I/O modules and motor control products
- Provides one I/O DeviceNet message representing all connected devices
- Two independent ports for Plug-and-Play connection to I/O
- Powered from backplane
- Isolated from DeviceNet
- Status LEDs for DeviceNet and module health
- Provides for configuration of I/O devices over DeviceNet
- Small package size
- DIN rail mountable

Standards and Certifications

Approvals

Table 82. Approvals/Certifications

Description	Specification
Electrical/EMC	
ESD Immunity (IEC 61000-4-2)	± 8 kV air, ± 4 kV contact
Radiated Immunity (IEC 61000-4-3)	10V/m 80 – 1,000 MHz, 80% amplitude modulation @ 1 kHz
Fast Transient (IEC 61000-4-4)	± 2 kV supply and control, ± 1 kV communications
Surge (IEC 61000-4-5)	± 1 kV line-to-ground, ± 2 kV line-to-line
RF Conducted (IEC 61000-4-6)	10V, .15 – 80 MHz
Magnetic Field (IEC 61000-4-8)	30A/m, 50 Hz
Other Approvals	
Ingress Protection Code	IP20
Radiated and Conducted Emissions	EN 5011 Class A
Agency Certifications	UL 508, CUL (CSA C22.2 No. 14), CE (Low Voltage Directive), ODVA Conformance Tested

Communication Adapters (D77D Series) — DeviceNet Adapter

Technical Data and Specifications**Table 83. DeviceNet Specifications**

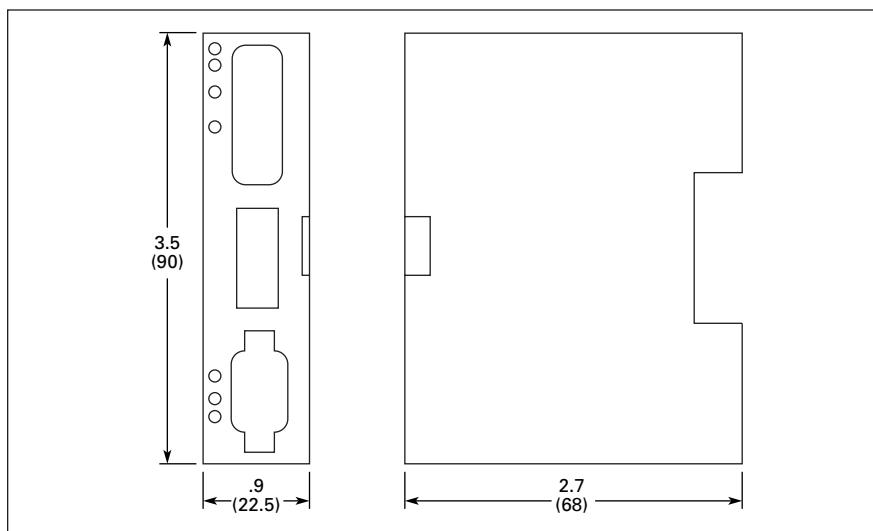
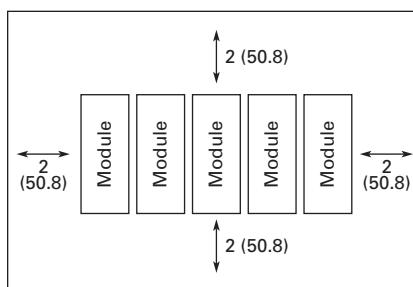
Description	Specification
DeviceNet Connections	Group 2, Polling, Bit Strobe, Explicit, No UCMM
Maximum DeviceNet I/O Size	128 Bytes Input 128 Bytes Output
DeviceNet Baud Rate	125K, 250K, 500K
QCPort Channels	2 Independent Channels

Table 84. Environmental Ratings

Description	Specification
Transportation/Storage	
Temperature	-58° - 176°F (-50° - 80°C)
Humidity	5 - 95% non-condensing

Operating

Temperature	-13° - 131°F (-25° - 55°C)
Humidity	5 - 95% non-condensing
Altitude	Above 6,600 ft. (2,000m) consult factory
Shock (IEC 68-2-27)	15G any direction for 11 mS
Vibration (IEC 68-2-6)	5 - 150 Hz, 5G .7 mm maximum peak-to-peak
Pollution Degree	2

Dimensions**Figure 73. D77D-DNA — Approximate Dimensions in Inches (mm)****Figure 74. D77D-DNA Module Ventilation — Approximate Dimensions in Inches (mm)****Product Selection****Table 85. DeviceNet Adapter Product Selection**

Description	Catalog Number	Price U.S. \$
DeviceNet Adapter	D77D-DNA	406.

Discount Symbol 1CD1



Cat. No. D77D-EMA

Product Description

The Cutler-Hammer® Intelligent Technologies (IT) Ethernet Modbus Adapter (D77D-EMA) from Eaton's electrical business has greatly increased the functionality of Cutler-Hammer IT. communicating products, allowing monitoring and control for IT. I/O and IT. motor control devices. The adapter concentrates all data from these devices into a single Modbus node.

The Modbus Adapter supports not only Modbus TCP but also Modbus serial (ASCII and RTU) as a slave device. This combination of the two physical layers provides for ultimate functionality when connecting to a Modbus system. A unique attribute of the D77D-EMA is that it supports Modbus serial Pass-Through. In this mode a customer can connect Modbus serial devices to one of the channels and monitor and control them over Modbus TCP.

To simplify the configuration of the D77D-EMA, a simple auto-configure button press sets the system up for default operation. This automatically configures the Modbus registers to the I/O system devices.

Application Description

In a typical Modbus Adapter application, the D77D-EMA connects directly to Modbus, and resides in a system with IT. I/O and other communicating motor controls. The data from these IT. devices is assembled into input and output registers before being presented to Modbus.

Features, Functions and Benefits

- Communication to Modbus consuming one address
- Supports Boot P and static IP addressing
- 10/100 BaseT Connection
- RS-485 Modbus slave serial connection
- Supports Serial Modbus Pass-Through over Modbus TCP
- Provides for control of all IT. communicating devices connected to the gateway
- Manually set to address and baud rate for serial Modbus; configuration using a software application is not required for normal operation
- Single button press auto configures the gateway, setting up the system for default operation
- Advanced configuration using CH Studio
- Provides for backplane and inter-connect cable connections to I/O modules and motor control products
- Two independent ports for Plug-and-Play connection to I/O
- Powered from backplane
- Isolated from Modbus
- Status LEDs for Modbus and module health
- Provides for configuration of I/O devices over Modbus TCP
- Small package size
- DIN rail mountable

Standards and Certifications

Approvals

Table 86. Approvals/Certifications

Description	Specification
Electrical/EMC	
ESD Immunity (IEC 61000-4-2)	± 8 kV air, ± 4 kV contact
Radiated Immunity (IEC 61000-4-3)	10V/m 80 – 1,000 MHz, 80% amplitude modulation @ 1 kHz
Fast Transient (IEC 61000-4-4)	± 2 kV supply and control, ± 1 kV communications
Surge (IEC 61000-4-5)	± 1 kV line-to-ground, ± 2 kV line-to-line
RF Conducted (IEC 61000-4-6)	10V, .15 – 80 MHz
Magnetic Field (IEC 61000-4-8)	30A/m, 50 Hz

Other Approvals

Ingress Protection Code	IP20
Radiated and Conducted Emissions	EN 5011 Class A
Agency Certifications	UL 508, CUL (CSA C22.2 No. 14), CE (Low Voltage Directive), Modbus Conformance Tested

Technical Data and Specifications

Table 87. Environmental Ratings

Description	Specification
Transportation/Storage	
Temperature	-58° – 176°F (-50° – 80°C)
Humidity	5 – 95% non-condensing
Operating	
Temperature	-13° – 149 °F (-25° – 65°C)
Humidity	5 – 95% non-condensing
Altitude	Above 6,600 ft. (2,000m) consult factory
Shock (IEC 68-2-27)	15G any direction for 11 mS
Vibration (IEC 68-2-6)	5 – 150 Hz, 5G .7 mm maximum peak-to-peak
Pollution Degree	2

Table 88. Modbus Specifications

Description	Specification
Connections	10/100 BaseT RS-485
I/O Size	1024 Registers Input 1024 Registers Output
Baud	Ethernet 10 Megabit Serial 1200 to 115.2K baud
Addressing	Ethernet – Boot P or Static IP Serial – DIP Switch 1 – 255
Channels	2 Independent Channels

Communication Adapters (D77D Series) — Modbus Adapter

Dimensions

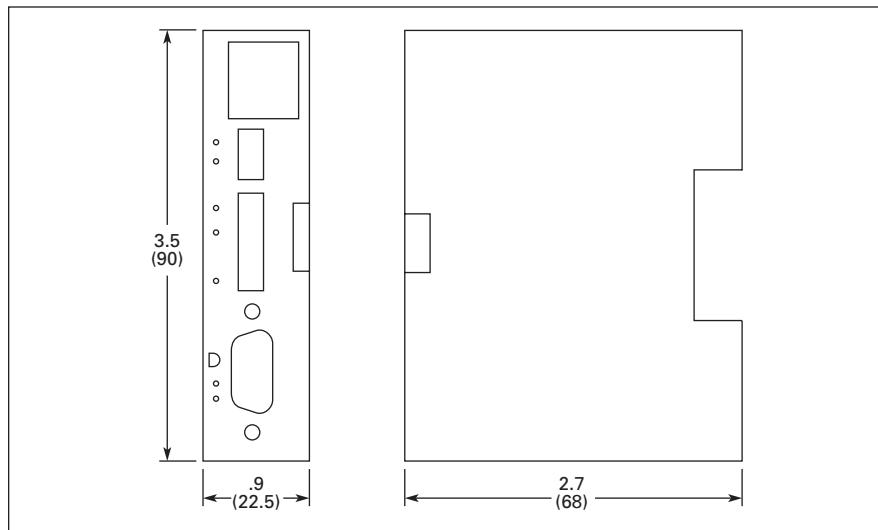


Figure 75. D77D-EMA — Approximate Dimensions in Inches (mm)

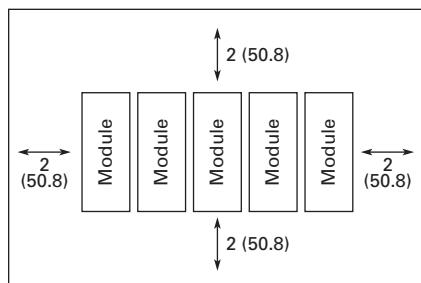


Figure 76. D77D-EMA Module Ventilation — Approximate Dimensions in Inches (mm)

Product Selection

Table 89. Modbus Adapter Product Selection

Description	Catalog Number	Price U.S. \$
Modbus Adapter	D77D-EMA	499.

Discount Symbol 1CD1



Cat. No. D77D-EIP

Product Description

The Cutler-Hammer® Intelligent Technologies (*IT*.) EtherNet/IP (D77D-EIP) from Eaton's electrical business has greatly increased the functionality of Cutler-Hammer *IT*. communicating products, allowing monitoring and control for *IT*. I/O and *IT*. motor control devices. The adapter concentrates all data from these devices into a single EtherNet/IP node.

The EtherNet/IP Adapter is a slave device on EtherNet/IP.

To simplify the configuration of the D77D-EIP, a simple auto-configure button press sets the system up for default operation. This automatically configures the EtherNet/IP assemblies to the I/O system devices.

Application Description

In a typical EtherNet/IP Adapter application, the D77D-EIP connects directly to EtherNet/IP, and resides in a system with *IT*. I/O and other communicating motor controls. The data from these *IT*. devices is assembled into input and output assemblies before being presented to EtherNet/IP.

Features, Functions and Benefits

- Communication to EtherNet/IP consuming one address
- Supports Boot P, DHCP and static IP addressing
- 10/100 BaseT Connection
- Provides for control of all *IT*. communicating devices connected to the network adapter
- Single button press auto configures the gateway, setting up the system for default operation
- Advanced configuration using CH Studio
- Provides for backplane and inter-connect cable connections to I/O modules and motor control products
- Two independent ports for Plug-and-Play connection to I/O
- Powered from backplane
- Isolated from EtherNet/IP
- Status LEDs for EtherNet/IP and module health
- Provides for configuration of I/O devices over EtherNet/IP
- Small package size
- DIN rail mountable

Standards and Certifications

Approvals

Table 90. Approvals/Certifications

Description	Specification
Electrical/EMC	
ESD Immunity (IEC 61000-4-2)	± 8 kV air, ± 4 kV contact
Radiated Immunity (IEC 61000-4-3)	10V/m 80 – 1,000 MHz, 80% amplitude modulation @ 1 kHz
Fast Transient (IEC 61000-4-4)	± 2 kV supply and control, ± 1 kV communications
Surge (IEC 61000-4-5)	± 1 kV line-to-ground, ± 2 kV line-to-line
RF Conducted (IEC 61000-4-6)	10V, .15 – 80 MHz
Magnetic Field (IEC 61000-4-8)	30A/m, 50 Hz
Other Approvals	
Ingress Protection Code	IP20
Radiated and Conducted Emissions	EN 5011 Class A
Agency Certifications	UL 508, CUL (CSA C22.2 No. 14), CE (Low Voltage Directive), Modbus Conformance Tested

Technical Data and Specifications

Table 91. Environmental Ratings

Description	Specification
Transportation/Storage	
Temperature	-58° – 176°F (-50° – 80°C)
Humidity	5 – 95% non-condensing
Operating	
Temperature	-13° – 149 °F (-25° – 65°C)
Humidity	5 – 95% non-condensing
Altitude	Above 6,600 ft. (2,000m) consult factory
Shock (IEC 68-2-27)	15G any direction for 11 mS
Vibration (IEC 68-2-6)	5 – 150 Hz, 5G .7 mm maximum peak-to-peak
Pollution Degree	2

Table 92. EtherNet/IP Specifications

Description	Specification
Connections	10/100 BaseT
I/O Size	504 bytes Input 504 bytes Output
Baud	Ethernet 10/100 Megabit
Addressing	Ethernet – Boot P, Static IP or DHCP
Channels	2 Independent Channels

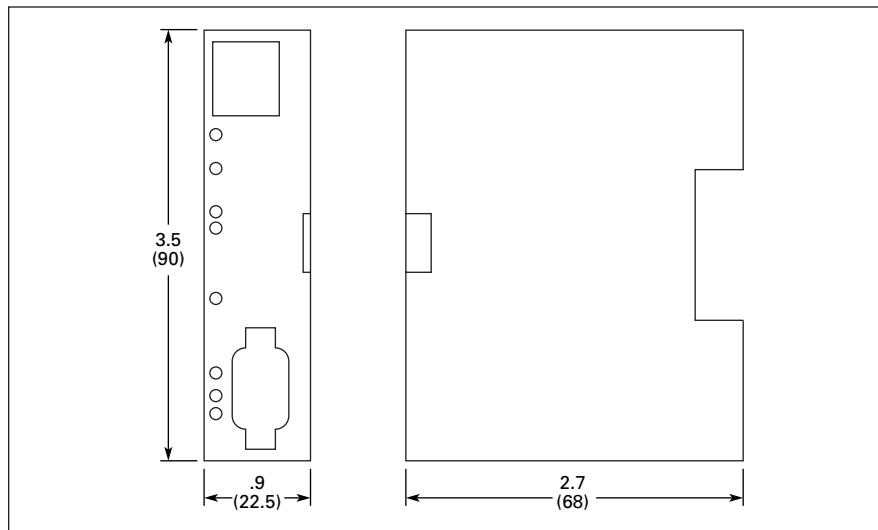
Dimensions

Figure 77. D77D-EIP — Approximate Dimensions in Inches (mm)

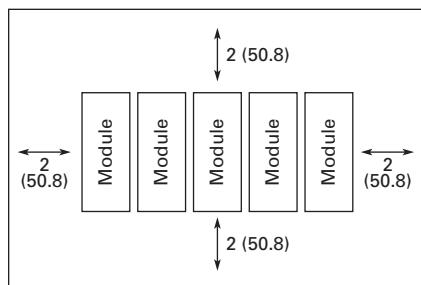
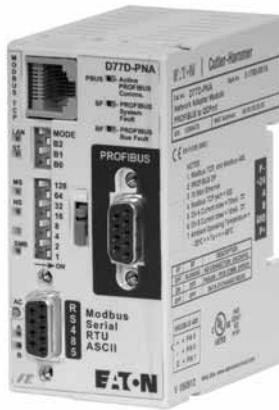


Figure 78. D77D-EIP Module Ventilation — Approximate Dimensions in Inches (mm)

Product Selection**Table 93. EtherNet/IP Adapter Product Selection**

Description	Catalog Number	Price U.S. \$
Modbus Adapter	D77D-EIP	510.



Cat. No. D77D-PNA

Product Description

The Cutler-Hammer® Intelligent Technologies (*IT.*) PROFIBUS Adapter (D77D-PNA) from Eaton's electrical business has greatly increased the functionality of Cutler-Hammer *IT.* communicating products, allowing monitoring and control for *IT.* I/O and *IT.* motor control devices. The adapter concentrates all data from these devices into a single node.

The PROFIBUS Adapter supports not only PROFIBUS but also Modbus (ASCII and RTU) as a slave device. This combination of the two physical layers provides for ultimate functionality when connecting to a control system. This unique feature of the D77D-PNA provides for deterministic control using PROFIBUS along with the flexibility to monitor and configure I/O devices over Modbus. The Modbus connection is a read-only connection not allowing control of I/O devices ensuring a single point of control.

To simplify the configuration of the D77D-PNA, a simple auto-configure button press sets the system up for default operation. This automatically configures the telegrams to the system devices.

Application Description

In a typical PROFIBUS Adapter application, the D77D-PNA connects directly to PROFIBUS, and resides in a system with *IT.* I/O and other communicating motor controls. The data from these *IT.* devices is assembled into input and output telegrams before being presented.

Features, Functions and Benefits

- Communication to PROFIBUS consuming one address
- Supports hardware addressing
- DB9 Connection
- Modbus slave connections on motherboard
- Provides for control of all *IT.* communicating devices connected to the network adapter
- PROFIBUS supports autobaud
- Single button press auto configures the gateway, setting up the system for default operation
- Advanced configuration using CH Studio
- Provides for backplane and inter-connect cable connections to I/O modules and motor control products
- Two independent ports for Plug-and-Play connection to I/O
- Powered from backplane
- Isolated from PROFIBUS
- Status LEDs for module health
- Provides for configuration of I/O devices over Modbus TCP
- Small package size
- DIN rail mountable

Standards and Certifications

Approvals

Table 94. Approvals/Certifications

Description	Specification
Electrical/EMC	
ESD Immunity (IEC 61000-4-2)	± 8 kV air, ± 4 kV contact
Radiated Immunity (IEC 61000-4-3)	10V/m 80 – 1,000 MHz, 80% amplitude modulation @ 1 kHz
Fast Transient (IEC 61000-4-4)	± 2 kV supply and control, ± 1 kV communications
Surge (IEC 61000-4-5)	± 1 kV line-to-ground, ± 2 kV line-to-line
RF Conducted (IEC 61000-4-6)	10V, .15 – 80 MHz
Magnetic Field (IEC 61000-4-8)	30A/m, 50 Hz

Other Approvals

Ingress Protection Code	IP20
Radiated and Conducted Emissions	EN 5011 Class A
Agency Certifications	UL 508, CUL (CSA C22.2 No. 14), CE (Low Voltage Directive), Modbus Conformance Tested

Technical Data and Specifications

Table 95. Environmental Ratings

Description	Specification
Transportation/Storage	
Temperature	-58° – 176°F (-50° – 80°C)
Humidity	5 – 95% non-condensing
Operating	
Temperature	-13° – 149 °F (-25° – 65°C)
Humidity	5 – 95% non-condensing
Altitude	Above 6,600 ft. (2,000m) consult factory
Shock (IEC 68-2-27)	15G any direction for 11 mS
Vibration (IEC 68-2-6)	5 – 150 Hz, 5G .7 mm maximum peak-to-peak
Pollution Degree	2

Table 96. PROFIBUS Specifications

Description	Specification
Connection	DB9
I/O Size	244 Bytes Input 176 Bytes Output
Baud	Up to 12 Megabit
Addressing	DIP Switch 1 – 255
Channels	2 Independent Channels
CHA Current Draw	170 mA
CHB Current Draw	10 mA

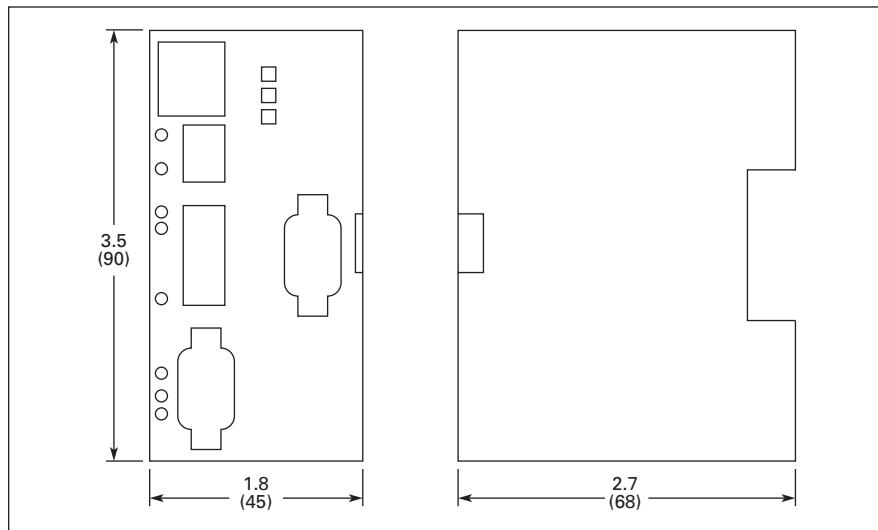
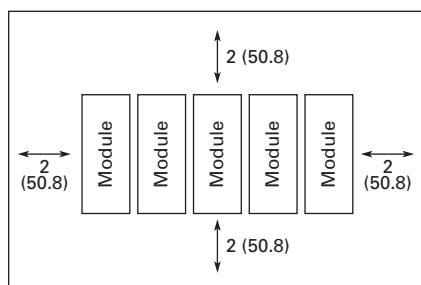
Dimensions

Figure 79. D77D-PNA — Approximate Dimensions in Inches (mm)

Figure 80. D77D-PNA Module Ventilation —
Approximate Dimensions in Inches (mm)**Product Selection****Table 97. PROFIBUS Adapter Product Selection**

Description	Catalog Number	Price U.S. \$
PROFIBUS Adapter	D77D-PNA	580.



CH Studio

Product Description

CH Studio Component Manager Software

CH Studio from Eaton's electrical business is an integrated software development environment that supports the configuration and monitoring of control products and systems. The application simplifies the monitoring and configuration of entire networks, as well as the enhanced features of individual *IT.* communicating devices within those networks.

CH Studio takes advantage of the Windows graphical interface to present a suite of tools that is easy to learn and efficient to use, while meeting the requirements for developing complex network configurations.



Screen Shot

CH Studio components include Explorer, Property, Output, Toolbox, Message Editor, Property Pages, and Device Selector windows and dialog boxes.

Configure Eaton's Cutler-Hammer Control Devices

Component Manager provides for the configuration and monitoring of the following Cutler-Hammer® products:

- *IT.* Motor Control Center (MCC)
- *IT.* Electro-Mechanical Motor Starters connected by a Starter Network Adapter Product (SNAP) or Cover Control
- *IT.* S751/S752 Soft Starters connected by a SNAP, Cover Control or a Network Adapter
- *IT.* I/O modules
- *IT.* S811 Soft Starter connected by network Adapter
- *IT.* D77D-DNA DeviceNet network Adapter
- *IT.* D77D-EMA Modbus/TCP network Adapter
- *IT.* D77D-EIP EtherNet/IP network Adapter
- *IT.* D77D-PNA PROFIBUS network Adapter
- Cutler-Hammer legacy DeviceNet products

Configure Other DeviceNet Products

CH Studio provides the capacity to configure and monitor all DeviceNet products that are supported by a published EDS file, regardless of vendor.

The DeviceNet management package includes prepackaged support of over 4000 different devices, and the capability to include new EDS files, as needed.

Application Description

The CH Studio Software runs on any personal computer hosting one of the following supported Windows operating systems:

- MS Windows XP
- MS Windows 2000

A typical automation system is comprised of a programmable logic controller acting as a master, and numerous slave devices such as network adapters, motor starters, or I/O modules. The devices are networked via an industrial fieldbus such as DeviceNet or Modbus/TCP.

A personal computer hosting CH Studio may be connected to an industrial network using a supported interface card or common Ethernet port (a variety of network protocols, such as Modbus/TCP, utilize Ethernet for a physical layer). CH Studio can then be used to configure and commission the automation products and network.

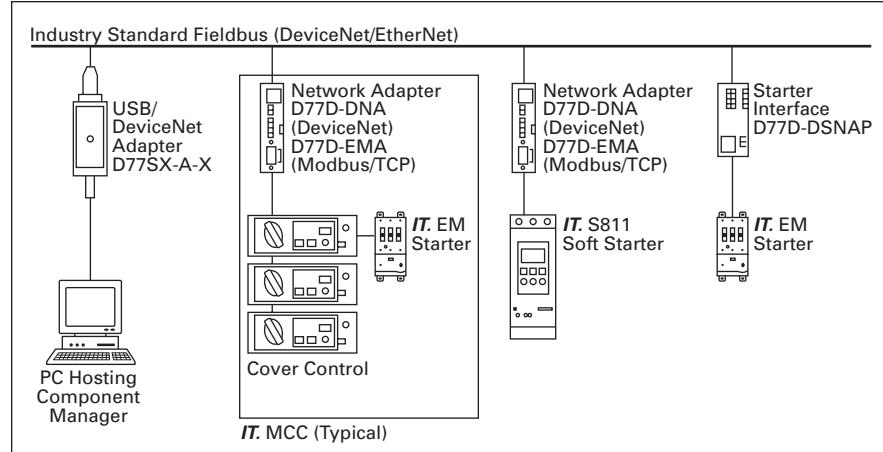


Figure 81. Network Diagram

Features, Functions and Benefits

Studio provides powerful features:

- Fast discovery of devices on DeviceNet, Modbus/TCP and Ethernet/IP networks.
- “Snapshot” storage of an entire networks worth of device parameters with just one mouse-click.
- Rapid configuration of *IT.* family products via “plug-in” support components that are regularly updated via the Internet.
- Online and offline operation with flexible synchronization options.
- Custom configuration dialogs for point and click ease of configuration, support for any DeviceNet product with or without EDS files.
- Extensive report generation to assist PLC or DCS programmers.
- OPC server for industry standard communications with third party products such as HMI, data acquisition and control applications.
- Built-in 4800+ device EDS file database.
- OPC server-to-control and monitor QCPort device over OPC.
- Tag export feature to import tag data to the controller.
- Live I/O to view actual status of the QCPort I/O when online.

Technical Data and Specifications

- Processor: 230 MHz Pentium class minimum; 300+ MHz recommended.
- Memory (RAM): 64 MB Minimum (may limit performance); 128 MB+ recommended.
- Hard Drive Space: 120 MB - CHStudio additional 70 meg for online documentation in .PDF format.
- Super VGA 800x600 or higher resolution video adapter and monitor.
- CDROM or DVD Drive (required for installation).
- Keyboard and Microsoft mouse or compatible pointing device.
- Industrial network adapter. Studio makes use of the Ethernet port that comes as standard equipment on most PCs for industrial protocols such as MODBUS/TCP. For DeviceNet networks a USB/DeviceNet converter is available, or you may use one of the popular SS Technologies Devicenet interfaces in the 5136 series (ISA, PCI, PCMCIA supported).

USB DeviceNet Adapter

The D77SX-A-X USB converter is a cost-effective interface for DeviceNet networks. Specifically designed for use with CH Studio, the USB converter provides a high performance DeviceNet interface with Plug and Play ease of installation. The D77SX-A-X comes in kit form including USB and 6-foot DeviceNet to mini cables. Drivers for the converter are built into CH Studio.

Product Selection

The following table lists the Catalog Numbers for available CH Studio software packages:

Table 98. CH Studio Product Selection

Description	Catalog Number	Price U.S. \$
CH Studio Component Manager V2.1	D77SC-X-D	1,040.
CH Studio Component Manager V2.1 w/USB interface	D77SC-A-D	1,325.
USB/DeviceNet Interface (Alone)	D77SX-A-X	555.
CH Studio Component Manager 2.1 and OPC Server	D77SC-X-P	1,315.
CH Studio Component Manager 2.1 OPC Server	D77SC-A-P	1,575.

Discount Symbol **1CD1**

Eaton Corporation
Electrical Group
1000 Cherrington Parkway
Moon Township, PA 15108
United States
877-ETN CARE (877-386-2273)
Eaton.com